TOTAL MAXIMUM DAILY LOAD (TMDL)

For TSS, Turbidity, and Siltation
For 13 Subsegments in the Ouachita River Basin

303(d) listed subsegments

Bayou Chauvin 080102
Bayou Louis 080202
Bayou Bartholomew (Scenic) 080401
Boeuf River 080901
Big Creek 080903
Bayou Lafourche 080904
Clear Lake 080910
Bayou Macon 081001
Joe's Bayou 081002
Tensas River 081201
Lake St. Joseph 081202
Little River- Castor Creek (Scenic) 081601
Little River- Bear Creek (Scenic) 081602

US EPA Region 6

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Executive Summary

Thirteen subsegments in the Ouachita River Basin are listed for sediment related issues on the 303(d) list for Louisiana. Ten subsegments are listed as having impairments related to total suspended solids (TSS), three are listed as having general siltation limitations and nine list turbidity as a cause of impairment. Using the latest data, three other subsegments have been identified as not meeting Water Quality Standards for turbidity. They are also addressed at this time. A watershed approach was used in developing this TMDL. This approach is most appropriate when addressing predominately nonpoint source issues such as sediment where inputs are distributed throughout the watershed. TSS loads that will allow compliance with state established turbidity standards have been calculated from relationships established with data from each subsegment.

The TMDL establishes a relationship between the three specific listings relating them all ultimately to the primary concern of sediment load. Numeric turbidity criteria have been adopted in the State's Water Quality Standards. Target load estimates for TSS were developed from regression analysis relationships between turbidity and TSS measurements. TSS loads that will allow compliance with State established turbidity criterion for the basin have been calculated for each subsegment in the basin. This TMDL establishes that fluvial erosion processes in the watershed are by far the dominant contributor to these measured parameters. Therefore, this TMDL addresses inorganic suspended solids (i.e., soil and sediment particles from erosion or sediment resuspension) rather than organic suspended solids associated with discharges from point sources. This TMDL does not affect permitted TSS discharges from wastewater treatment facilities. Due to their transient nature it is difficult to estimate sediment loads originating from construction site stormwater. This TMDL accommodates loads from these facilities as part of the uncertainty component in the allocation for margin of safety.

In the Ouachita River Basin TMDL, water quality monitoring stations with historical water quality data were evaluated to establish a watershed relationship between turbidity and TSS. A mathematical expression of this relationship was developed and used to calculate TSS values that, if met, would allow compliance with the turbidity standard in that watershed and reduce the potential for formation of bottom deposits. Because point source contribution of inorganic suspended solids were not considered, load allocations for nonpoint source contribution of TSS were set equal to the total allowable loads minus an explicit margin of safety of 20%. Necessary sediment reductions range from 11% to 77% with five subsegments requiring no reductions in order to meet the established targets during the dry season. The turbidity percent reductions range from 1% to 86% with two subsegments requiring no reductions in order to meet the standard in the dry season. The reasonable assurance calculations on the subsegments show that the percent reductions appear to be achievable. The water entering three subsegments (080401, 080901 and 081001) from Arkansas is listed as impaired in Arkansas for siltation/turbidity. The implementation plans for the Arkansas TMDLs currently under development will reduce the amount of sediment entering Louisiana. That would lower the load reduction required within Louisiana.

1. Introduction

Section 303(d) of the Clean Water Act as amended by the Water Quality Act of 1987, and EPA's regulations under 40 CFR Part 130 require that each state identify those waters within its boundaries not meeting water quality standards. Section 303(d) of the Federal Clean Water Act further requires that states develop TMDL management plans for water bodies determined to be water quality limited. A TMDL documents the amount of a pollutant a water body can assimilate without violating the State's water quality standards. It also allocates that load capacity to known point sources and nonpoint sources. TMDLs are defined under 40 CFR Part 130 as the sum of the individual Waste Load Allocations (WLAs) for point sources, Load Allocations (LAs) for nonpoint sources which include man-made and natural background conditions, and a margin of safety (MOS).

2. Study Area Description

2.1 General Information

The Ouachita River's source is found in the Ouachita Mountains of west-central Arkansas near the Oklahoma border. The Ouachita River flows south through northeastern Louisiana and joins with the Tensas River to form the Black River, which empties into the Red River. The Ouachita River Basin covers more than 25,600 square kilometers of drainage area. Most of the basin consists of rich, alluvial plains cultivated in cotton, corn and soybeans. The northwest corner of the basin is forested in pine, which is commercially harvested. (LDEQ, 2000)

The area of the thirteen subsegments being considered in the Ouachita River Basin is 10,018.67 square kilometers. The land use in the ten Non-Scenic subsegments is largely agriculture at 67% with 23% forest (USEPA, 2001). The land use in the three Scenic subsegments is largely forest at 86% with 4% agriculture. The average annual rainfall is approximately 55.24 inches. Urban land use comprises only 1.3% of the geographic area with Monroe/West Monroe being the largest urban area in the study. Land uses for the composite of the 13 subsegments covered by this TMDL in the Ouachita River Basin are summarized in Table 1, the three Scenic subsegments are shown in Table 2 and the ten Non-Scenic subsegments are shown in Table 3. Individual land use tables for each subsegment are shown in Appendix A.

Table 1. Land Use (km^2) in the 13 Subsegments of the Ouachita River Basin

Coverage Type	Area km2	Percent of Watershed
Row Crops	5363.09	53.53%
Forested Wetlands	1552.07	15.49%
Small Grains	717.58	7.16%
Pasture	599.57	5.98%
Mixed Forest	594.05	5.93%
Evergreen Forest	514.58	5.14%
Deciduous Forest	299.11	2.99%
Water	178.54	1.78%
Urban	135.22	1.35%
Other	38.07	0.38%
Non Forested Wetlands	31.65	0.32%
TOTAL	10018.67	100.00%

Table 2. Land Use (km^2) in the 3 Scenic Subsegments of the Ouachita River Basin

Coverage Type	Area km2	Percent of Watershed
Evergreen Forest	399.58	38.56%
Mixed Forest	184.11	17.77%
Forested Wetlands	140.93	13.60%
Deciduous Forest	134.32	12.96%
Pasture	67.23	6.49%
Row Crops	39.65	3.83%
Other	31.74	3.06%
Water	20.57	1.98%
Urban	11.93	1.15%
Small Grains	5.55	0.54%
Non Forested Wetlands	0.67	0.06%
TOTAL	1036.29	100.00%

Table 3. Land Use (km^2) in the 10 Non-Scenic Subsegments of the Ouachita River Basin

Coverage Type	Area km2	Percent of Watershed
Row Crops	5323.44	59.27%
Forested Wetlands	1411.14	15.71%
Small Grains	712.02	7.93%
Pasture	532.34	5.93%
Mixed Forest	409.94	4.56%
Deciduous Forest	164.79	1.83%
Water	157.98	1.76%
Urban	123.29	1.37%
Evergreen Forest	115.00	1.28%
Non Forested Wetlands	30.98	0.34%
Other	6.33	0.07%
TOTAL	8982.38	100.00%

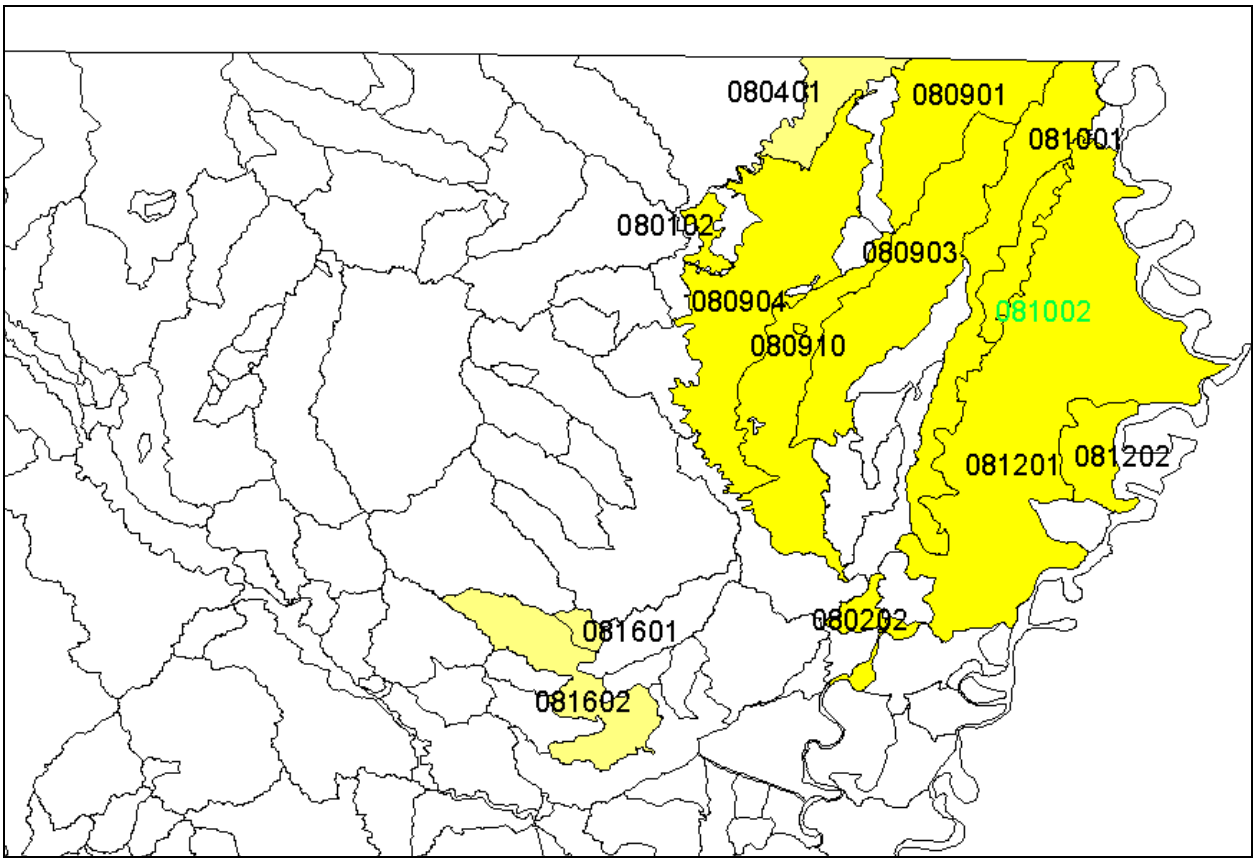

Figure 1. Map of Ouachita River Basin, Impaired Shaded

2.2 Problem Statement

The subsegments shown in Table 4 were included on the Louisiana 303(d) list as not fully supporting the water quality standard with TSS, siltation, and/or turbidity as the cause of nonsupport. These original assessments were based largely on the best professional judgment of the Louisiana Department of Environmental Quality (LDEQ) regional coordinators, often without the benefit of quantitative data. Informal, qualitative visual observations, not quantitative data, were the basis for many of these listings. While reviewing the monitoring data to prepare this document, it was found that three subsegments in this TMDL not specifically listed for turbidity also exceeded the standard for turbidity. These subsegments (080202, 081002, 081202) are also addressed at this time.

Table 4. Listings for the Ouachita River Basin.

LDEQ Subsegment	Subsegment Description	Cause of Impairment
080102	Bayou Chauvin - Headwaters to the Ouachita River	Suspended Solids, Turbidity
080202	Bayou Louis - Headwaters to the Ouachita River	Siltation, Turbidity*
080401	Bayou Bartholomew-Arkansas State Line to Dead Bayou(Scenic)	Suspended Solids, Turbidity
080901	Boeuf River - Arkansas State Line to Ouachita River	Suspended Solids, Turbidity, Siltation
080903	Big Creek - Headwaters to Boeuf R (inc. Big Colewa B)	Suspended Solids, Turbidity
080904	Bayou Lafourche-nr Oakridge to Boeuf R nr Columbia	Suspended Solids, Turbidity
080910	Clear Lake	Suspended Solids
081001	Bayou Macon - Arkansas State Line to Tensas R	Suspended Solids, Turbidity
081002	Joe's Bayou Headwaters to Bayou Macon	Suspended Solids, Turbidity*
081201	Tensas R -Headwaters to Jonesville (inc. Tensas B)	Suspended Solids, Turbidity
081202	Lake St. Joseph (Oxbow Lake)	Suspended Solids, Turbidity*
081601	Little River- Castor Ck & Dugdemona R to Bear Ck(Scenic)	Turbidity
081602	Little River- Bear Creek to Catahoula Lake(Scenic)	Turbidity, Siltation

* Additional turbidity impairment added during data analysis.

2.2.1 Turbidity and TSS

Turbidity is the measure of the optical property of water that causes light to be either scattered or absorbed. Turbidity may be influenced by a number of factors but is primarily affected by suspended matter such as clay, silt, plankton, or microscopic organisms (APHA, 1992). These constituents are the same components that would contribute to TSS. Although turbidity may be influenced by other factors, effects due to TSS will be captured in a turbidity measure.

The State of Louisiana has established acceptable numeric turbidity standards for many of its streams including the Ouachita River Basin. The State has not established a numerical criterion for TSS. There is a moderate to strong relationship between turbidity and TSS as evidenced by the correlation coefficients of 0.63 for January to June and 0.78 for July to December. Turbidity listings almost always originated from the State's 305(b) or 303(d) lists while siltation and TSS listed waters originated largely from the State's nonpoint source list.

2.2.2 Siltation

Numerous waters are included on the Louisiana 303(d) list as impaired due to siltation. As with TSS, there are no numeric guidelines or criteria for siltation and there is little or no existing information available that would allow a direct evaluation of stream substrate conditions. Louisiana's water quality standards provide a link between suspended solids and bottom deposits, stating that floating, settleable, and suspended solids shall not be present in

quantities sufficient to cause long-term bottom deposits. For siltation, a water column measure, or indicator, may be used as a quantitative expression of water quality impacts. A water column characteristic that has been widely used as an indicator of the potential for sediment accumulation in streambeds is suspended sediment (USEPA, 1999). Siltation may be described as the effect created as suspended matter from the water column settles to the stream bottom. Water column data for TSS is available from the Louisiana water-quality monitoring network. In this TMDL, TSS is used as an indicator for siltation or bottom deposits resulting from inorganic sediment loads.

2.3 Water Quality Standards

Designated uses for all subsegments are primary contact recreation; secondary contact recreation; propagation of fish and wildlife. Four subsegments (080401, 080610, 081601, 081602) also have the designated use of outstanding natural resource waters.

Numeric criterion for turbidity may be found in the Louisiana Water Quality Standards at §1113.B.9. This reads:

> "Turbidity
>
> a) Turbidity other than that of natural origin shall not cause substantial visual contrast with the natural appearance of the waters of the state or impair any designated water use. Turbidity shall not significantly exceed background; background is defined as the natural condition of the water. Determination of background will be on a case-by-case-basis.
>
> b) As a guideline, maximum turbidity levels, expressed as nephelometric turbidity units (NTU), are established and shall apply for the following named water bodies and major aquatic habitat types of the state:
>
> i.) Red, Mermentau, Atachafalya, Mississippi, and Vermilion Rivers and Bayou Teche—150 NTU;
> ii.) Estuarine lakes, bays, bayous, and canals—50 NTU;
> iii.) Amite, Pearl, Ouachita, Sabine, Calcasieu, Tangipahoa, Tickfaw, and Techefuncte Rivers—50 NTU;
> iv.) Freshwater lakes, reservoirs, and oxbows—25 NTU;
> v.) Designated scenic streams and outstanding natural resource waters not specifically listed in Subsection B.9.b.i-iv of this Section—25 NTU;
> vi.) For other state waters not included in Subsection Bl.9.bi-v of this Section, and in waterbody segments where natural background turbidity exceeds the values specified in these clauses, turbidity in NTU caused by any discharges shall be restricted to the appropriate background value plus 10 percent. This shall not apply to designated intermittent streams."

Narrative criteria related to the water quality characteristics for TSS and siltation are found at §1113.B.3. This reads:

> "Floating, Suspended, and Settleable Solids. There shall be no substances present in concentrations sufficient to produce distinctly visible solids or scum, nor shall there be any formation of long-term bottom deposits of slimes or sludge banks attributable to waste discharges from municipal, industrial, or other sources including agricultural practices, mining, dredging, and the exploration for and production of oil and natural gas. The administrative authority may exempt certain short-term activities permitted under Sections 402 or 404 and certified under Section 401 of the Clean Water Act, such as maintenance dredging of

navigable waterways or other short-term activities determined by the state as necessary to accommodate to legitimate uses or emergencies or to protect the public health and welfare."

Narrative criteria related to the water quality characteristics for Biological and Aquatic Community Integrity are found at §1113.B.12. This reads:

> "Biological and Aquatic Community Integrity. The biological and community structure and function in state waters shall be maintained, protected, and restored except where not attainable and feasible as defined in LAC 33:IX.1109.B.3. This is the ideal condition of the aquatic community inhabiting the unimpaired water bodies of a specified habitat and region as measured by community structure and function. The biological integrity will be guided by the fish and wildlife propagation use designated for that particular water body. Fish and wildlife propagation uses are defined in LAC 33:IV.1111.C. The condition of these aquatic communities shall be determined from the measures of physical, chemical, and biological characteristics of each surface water body type, according to its designated use (LAC 33:IX.1123). Reference site conditions will represent naturally attainable conditions. These sites should be the least impacted and most representative of water body types. Such reference sites or segments of water bodies shall be those observed to support the greatest variety and abundance of aquatic life in the region as is expected to be or has been recorded during past surveys in natural settings essentially undisturbed by human impacts, development, or discharges. This condition shall be determined by consistent sampling and reliable measures of selected, indicative communities of animals and/or invertebrates as established by the office and may be used in conjunction with acceptable chemical, physical, and microbial water quality measurements and records as deemed for this purpose."

2.4 Target Determination

To develop a TMDL it is necessary to establish quantitative measures, or indicators, that can be used to quantify the relationship between pollutant sources and their impact on water quality. Once an indicator has been selected, a target value for that indicator which distinguishes between the impaired and unimpaired state of the water body (e.g. 25 mg/L TSS, or no more than 1000 tons/year sediment yield on average) must be established (USEPA, 1999). Often indicators needed to establish a TMDL are specified as a water quality standard. *For example, turbidity no greater than 50 NTU has been adopted as part of the State's water quality standards.* Often the water quality standard, as in the case with bottom-deposits, is established as a narrative with no associated numeric value. When such numeric values are not available, a target value must be developed for the selected indicator. Where such target values that are representative of the narrative standard are developed, the targets themselves are not water quality standards; rather, they are water body-specific numeric targets used to assess if a water body would be reasonably expected to be impaired based on the State's narrative standard. In this case the narrative standard addresses suspended solids and its relationship to formation of stream-bottom deposits, but does not establish a numeric value for its evaluation.

EPA developed target values or screening levels do not represent a water quality criterion or standard; rather, they are a numeric target used by EPA to assess if a water body would be reasonably expected to be impaired based on the state's biological and aquatic community integrity narrative criterion.

As previously stated, one method of establishing a TMDL target is to establish a relationship between two measured parameters, one of which has a numeric standard. These TMDLs have been developed using an established relationship between turbidity and TSS.

Where such functional relationships are used, they must be derived based on site-specific or comparable reference data.

2.4.1 Establishing the relationship

The most recent historical water quality data collected by LDEQ (1978 – 2001) from established subsegment monitoring stations were evaluated. The data set from 1958 – 1977 was not usable because turbidity and TSS were not sampled simultaneously. The data set was further reduced to represent normal conditions by removing extreme outliers. This was accomplished by removing 2% of the highest and lowest values for both turbidity and TSS. Sampling events that had both turbidity and TSS with extreme data points resulted in an overall reduction of approximately 7% rather than an expected 8%. The modified data set (n=987) was used in the regression analysis. The data extremes (n=76) in turbidity and TSS were removed. The modified data set and the period of record for each monitoring station are shown in Appendix B. The data extremes data set is shown in Appendix C.

Trends in historical turbidity were analyzed by year and month. Of the 1,063 sampling events, the turbidity standard (50 NTU) is exceeded in 699 sampling events or 63% of the time. A review of the monthly trends in turbidity during the same 23-year period reveals a definite seasonal pattern. The highest turbidities occur in January through June or wet season, and the lowest values occur in July through December or dry season. The same pattern exists using only the modified data set (n=987). The precipitation and runoff values for the State divisions show that the January to June period has 83% of the runoff establishing it as the wet season. Flow information is shown in Appendix G. There were more extreme values removed during the wet season than the dry season. Turbidity values, turbidity impairment with the percent of impairment of each listed subsegment by season, descriptive statistics and other text exhibits for this paragraph are shown in Appendix B. The annual turbidity trends over the 23-year period of record and other graphic exhibits for this paragraph are shown in Appendix D.

Trends in historical TSS were analyzed by year and month. The annual TSS values are quite variable throughout the 23-year period of record (n=1,063). Seasonal trends are not as evident for TSS as for turbidity in the full data set and the same is true using only the modified data set (n=987). There were more extreme values removed during the wet season than the dry season. TSS values, descriptive statistics and other text exhibits for this paragraph are shown in Appendix B. Seasonal trends and other graphic exhibits for this paragraph are shown in Appendix E.

Correlation and simple linear regression analyses were used to determine the relationship between turbidity and TSS. Work done for turbidity TMDLs in other subsegments of the Ouachita River Basin by FTN Associates, LTD (FTN, 2001) used the single variable regression using turbidity and TSS. They investigated single variable regressions with turbidity, TSS, stream flow, TOC, TDS and chlorophyll a. They also investigated multiple variable regressions with turbidity, stream flow, TSS, TOC and TDS. The turbidity vs TSS relationship approach used previously in the Region, the work by FTN, and the data analysis for these subsegments gives us confidence that the single variable regression selected is appropriate for this basin.

Because of the obvious seasonal trends, the data set was divided into two parts: January through June representing the wet weather months and July through December representing the dry weather months. In order to meet the normality assumption of linear regression, it was necessary to log transform the data prior to any regression analyses. Scatter plots of the log of the TSS value vs. the log of the turbidity value were created for each season and are shown in Appendix F. The plotted points of turbidity and TSS for each season follow a discernable linear pattern in which TSS increases as turbidity increases. This is expected as indicated in our previous discussion of TSS and turbidity. The strength of this relationship is measured using the correlation coefficient (r). The correlation coefficient can be calculated by taking the square root of the coefficient of determination (R^2) from the regression analysis. As the value of r approaches one, the relationship is said to have a high correlation and thus a strong relationship. Taking the square root of the R^2 value of 0.4036 and 0.6078 shown in Table 5, results in a correlation coefficient of 0.64 and 0.78, respectively. Therefore, there is a moderate correlation or relationship between turbidity and TSS for the wet season and stronger relationship during the dry season. A meaningful mathematical expression of this relationship can be established using simple linear regression. Rarely in regressions of natural biological systems is the change in one variable shown to be determined 100% by the change in the second variable. Natural systems are complex with many contributors that have various interactions. Purely mathematical manipulations of the standard water quality readings do not readily indicate why turbidity and TSS do not change at the same rate with each pair of samples. This indicates a need for research into these natural systems to establish these complex relationships.

A simple linear regression analysis can be used to determine the mathematical equation that represents the relationship between TSS and turbidity. This equation can then be used to predict the TSS value for a known turbidity value. As mentioned above, a scatter plot can be created to graphically display the relationship between the two parameters by plotting the observed TSS values against the observed turbidity values. Adding the "best fit line" through the points on the graph provides a visually representation of the mathematical equation from the regression analysis and the observed data points. The mathematical equation represented by this "best fit line" can be used to predict a value of log y for a given value of log x. This line is expressed mathematically by the general formula, log y = b(log x) + c, where log y is the predicted value of the dependent variable (TSS in this case), log x is the known or observed value of the independent variable (turbidity in this case), b is the slope of the line and c is a constant. This basin-wide specific formula can be used to calculate a TSS concentration, in mg/L, for a given turbidity value for each season.

Table 5. Regression Equations for the 13 Subsegments of the Ouachita River Basin

Season	Regression Equation	R^2	p-value
Jan - Jun	Log y = 0.6846 (log x) + 1.022	0.4036	1.17E-08
Jul - Dec	Log y = 0.7182 (log x) + 1.179	0.6078	8.72E-28
Bayou Louis	Log y = 0.5675 (log x) + 0.4256	0.7135	0.0331

The strength of the linear relationship is measured by the coefficient of determination (R^2) calculated during the regression analysis (Zar, 1996). The R^2 value is the percentage of the total variation in log y (TSS) that is explained or accounted for by the fitted regression (log x). Therefore, during the wet season, 40% of the variation in TSS is accounted for by turbidity and the remaining 60% of variation in TSS is unexplained. Likewise, during the dry season, 61% of the variation in TSS is accounted for by turbidity and the remaining 39% of variation in TSS is unexplained. The unexplained portion is attributed to factors other than turbidity such as chlorophyll *a,* color and bacteria. Applying the formula given in Table 5, a target TSS concentration may be calculated for each season by substituting the log of the turbidity standard of 50 NTU for flowing waters (3.912023) for x and solving the equation for log y. The resulting value (log y) must be back-transformed to its original format by taking the inverse log. The back-transformed value is the associated TSS value (mg/L) that would allow for compliance with the turbidity standard for 50 NTU for flowing waters. In this case the resultant TSS is 40 mg/l. The same equation may be applied to lakes by substituting the log of the turbidity guideline of 25 NTU for lakes (3.218876) for x and following the same procedure.

Using the process described above, coefficient and regression analyses were run for each season producing separate regression equations. The two seasonal equations were statistically significant (p-value $\leq$ 0.0001, alpha = 0.05). Bayou Louis data did not fit the general seasonal regression equations. The Bayou Louis data was used to create an annual regression equation specific for Bayou Louis. The Bayou Louis equation was statistically significant (p-value = 0.0331, alpha = 0.05). Using the two seasonal equations, target TSS concentrations were calculated for each subsection, except for Bayou Louis. The Bayou Louis annual equation was used to calculate a target TSS concentration, recording the same value in both seasonal tables. These values are shown in Tables 6 and 7.

Subsegment 080910 Clear Lake did not have monitoring data collected, so an ambient condition could not be calculated. Clear Lake will not appear in Tables 6 through 9. The Clear Lake subsegment is surrounded by subsegment 080901 Boeuf River. BMPs implemented in the parish for subsegment 080901 should also be implemented in the part of the parish that is in subsegment 080910. That should improve the water quality of Clear Lake, and future monitoring will determine if further actions are required.

The ambient condition values for turbidity and TSS were calculated as the mean of the records used for the regression analysis for the nine non-scenic subsegments. The ambient condition values for turbidity and TSS were calculated as the mean of the last five years of records for the two scenic subsegments and subsegment 080401 Bayou Bartholomew. Subsegment 081601 Little River - Castor Creek has two monitoring sites, only one shows impairment, the ambient condition was calculated using the impaired site.

Table 6. Target calculations for the Ouachita River Basin for January to June.

Subsegment	Description	Turbidity Guideline NTU	Jan-Jun Current Ambient NTU	Turbidity % Reduction	Jan-Jun TSS Guideline (mg/l)	Jan-Jun Current Ambient TSS (mg/l)
080102	Bayou Chauvin	50	73.17	32%	40	68.28
080202	Bayou Louis	50	53.6	7%	25	22.66
080401	Bayou Bartholomew	25	54.59	54%	25	27.56
080901	Boeuf River	50	139.58	64%	40	95.98
080903	Big Creek	50	96.04	48%	40	71
080904	Bayou Lafourche	50	150.08	67%	40	95.19
081001	Bayou Macon	50	109.02	54%	40	140.9
081002	Joe's Bayou	50	370	86%	40	122.4
081201	Tensas River	50	157.94	68%	40	96.25
081202	Lake St. Joseph	25	83.5	70%	25	53.63
081601	Little River- Castor Ck	25	29.75	16%	25	22.55
081602	Little River- Bear Ck	25	25.16	1%	25	36.93

Table 7. Target calculations for the Ouachita River Basin for July to December.

Subsegment	Description	Turbidity Guideline NTU	Jul-Dec Current Ambient NTU	Turbidity % Reduction	Jul-Dec TSS Guideline (mg/l)	Jul-Dec Current Ambient TSS (mg/l)
080102	Bayou Chauvin	50	92.5	46%	54	122.33
080202	Bayou Louis	50	15.2	0%	25	14.62
080401	Bayou Bartholomew	25	25.65	3%	33	24.29
080901	Boeuf River	50	66.71	25%	54	75.13
080903	Big Creek	50	53.72	7%	54	55.70
080904	Bayou Lafourche	50	73.04	32%	54	74.60
081001	Bayou Macon	50	71.99	31%	54	101.52
081002	Joe's Bayou	50	82.5	39%	54	38.00
081201	Tensas River	50	47.43	0%	54	34.29
081202	Lake St. Joseph	25	37.2	33%	33	49.2
081601	Little River- Castor Ck	25	25.5	2%	33	20.32
081602	Little River- Bear Ck	25	26.2	5%	33	35.58

2.5 Nonpoint Sources

Two primary sources of TSS and sediment are erosional processes in the watershed and resuspension of bottom deposits to the water column. Particulate matter resulting from the weathering of host rock is delivered to stream channels through various erosional processes, including sheetwash, gully and rill erosion, wind, landslides, dry ravel, and human excavation. Additionally, sediments are often produced as a result of stream channel and bank erosion and

channel disturbance. Movement of eroded sediments downslope from their points of origin into stream channels and through stream systems is influenced by multiple interacting factors. Eroded sediments are often trapped on hill slopes and stored in and alongside stream channels (US EPA, 1999). During high flow events stored sediment becomes mobilized and suspend in the water column. As the flow decreases the suspended solids settle downstream. Settled suspended solids (bottom sediment) can become resuspended in the water column during times of increased stream flow and by wind and wave action in shallow lakes.

The two most significant factors affecting TSS and sediment in this basin are suspended solids in wet weather runoff and land use. The wet season, January through June, has 83% of the runoff. Much of the sediment load comes from areas of the basin that have developed more intensive agricultural uses. Land use analysis shows that 73% of the land in the non-scenic subsegments is in cropland or pasture.

The anthropogenic effects on the land for the generation of sediment, which is measured in TSS, are greatest in agriculture/silviculture land use categories. Generally, in order of effect are the land uses row crop, small grains, pasture and forest. The row crop land use allows more opportunity for the use of a cultivator for weed control. This process has positive effects of reducing surface soil compaction that increases infiltration of rainfall and a small increase in the residue cover from the weeds. This process has negative effects of loosening the soil to facilitate the movement of soil particles. Row crops have less leaf cover during a portion of the growing season compared to small grain crops. The small grain crops have a higher density of plants per area than row crops, which protects the ground from the effects of raindrops, and the closer root structure, which help to protect the soil particles from the effect of runoff. The Louisiana Nonpoint Source Management Plan (LDEQ, 2000) lists BMPs for cropland for sediment. An assessment was made of the current level of implementation of BMPs in the parishes affected by these impaired subsegments. The level and types of BMPs implemented vary by parish. When the implementation plan is developed, the results of ongoing studies should improve the targeting and prioritizing of efforts. In general a higher level of conservation or no till, improved filter/buffer strips and crop residue use appear to be the where the largest gains can be made.

The anthropogenic effects on the pasture land use are related to the type and height of vegetation, grazing practices and watering practices. A tall dense mass of vegetation will retain more sediment than a short mown lawn like area. Grazing practices will effect the height and density of the vegetation, and determine the amount of cover for normal travel paths. Watering practices will determine if stream banks will be worn down by livestock accessing the stream and resuspending sediments with their traffic. The Section 319 Nonpoint Source National Monitoring Program (Lombardo, 2000) has had several projects with dramatic reductions in sediment from grazing operations that use fencing to control access to the streams and allow natural growth in a buffer area. The monitoring program has shown that even small areas can contribute to the subsegment's impairment if BMPs are not followed. Most of the cattle are located in 3 subsegments, but their effect cannot be overlooked in any segment. In general, the BMPs where the largest gains can be made are critical area planting, improved filter/buffer strips and fencing.

The anthropogenic effects on the various forest land uses are related to the harvesting of forest products. The reduction of cover in the cleared areas lasts for two years. These disturbed areas are the source of most of the contribution to sediment in the forest land uses. Access roads and stream crossings are another source of sediment in the forest areas. The three scenic subsegments have the highest forest land use. In general the BMPs where the largest gains can be made are streamside management zone items and timber harvesting items.

2.5.1 Point Sources

Point sources do not represent a significant source of TSS as defined in this TMDL. Wastewater treatment facilities discharge primarily organic TSS, which does not contribute to extensive habitat impairment resulting from sedimentation. The organic TSS is a non-conservative constituent that would only be detected as a component in proximity to the discharge point. Municipal permits contain a TSS limitation and a specific narrative requirement to prevent organic solids accumulation. Because an enforceable mechanism is in place to protect from discharges of organic suspended solids no TMDL is required for these materials.

This TMDL only addresses geomorphic contributions of TSS/sediment. Some discharges classified as point sources, such as construction sites, permitted through general permits, can discharge erosional sediment loads. These sites are transient in nature, because they cover only the construction activities at the site; once construction is complete these permits expire. These permits require implementation of BMPs and other requirements designed to reduce sediment load as a result of the permitted activity. Large-scale construction activities are most often found in areas with urban development. Land use is dominated by agricultural or forest uses. Urban land use is only 1.3 % of the total land. Given this low urban use it is not expected that construction activities are a significant source of TSS as defined in this document. For purposes of this TMDL the explicit margin of safety will be sufficient to address any uncertainties associated with sediment loads resulting from permitted construction activities.

3. TMDL Load Calculations

3.1 Calculation of Loads

Load allocations are calculated by first calculating the allowable load as expressed by the TSS target concentration value. This is accomplished by the formula:

Load (lbs/day) = Flow (mgd) * TSS concentration (mg/L) * 8.34

where 8.34 is a constant for unit conversions and TSS target and ambient concentration is taken directly from Table 6 or Table 7 as appropriate. To address the issue of uncertainty each calculated target load has been divided into two parts, TMDL load equal to 80% and MOS load equal to 20%. This will be used as an explicit margin of safety. The resulting load values are shown in Table 8 or Table 9 as appropriate.

The flow of each subsegment was calculated based on the area of the subsegment and a runoff depth that predicts volume that will flow out on an area in a given amount of time. The January to June time period was taken as one seasonal time period for calculating an average flow. The July to December time period was taken as the other seasonal time period for calculating an average flow. The runoff depth was taken from the Mean-Monthly Water Budget Summary and State division map provided by the Louisiana Office of State Climatology (LOSC, 2001). The State division map indicates the division boundaries and the parishes in each division. The composition of parishes in each subsegment was identified and the different division runoff numbers were combined based on the weighted area. The combined flow calculation can be found in Appendix G.

3.2 Total Maximum Daily Load for Turbidity, TSS, Siltation

This TMDL for turbidity is expressed in terms of percent reduction needed to achieve the turbidity standard for the listed subsegments. The turbidity percent reductions range from 1% to 86% with two subsegments requiring no reduction in the dry season and are shown in Table 6 for the wet season and in Table 7 for the dry season.

This TMDL for TSS is expressed in terms of pounds per day needed to achieve the target TSS load for the listed subsegments and are shown in Table 8 for the wet season and in Table 9 for the dry season. The TSS percent reduction needed to achieve the target TSS load for the listed subsegments range from 11% to 77% with five subsegments requiring no reduction in the dry season is also shown in Tables 8 and 9. The target TSS concentrations are expressed in mg/L and shown in Table 6 for the wet season and in Table 7 for the dry season.

The TMDL for siltation is expressed in terms of pounds per day. It is the same as the TMDL load for TSS. Reduction to the TMDL level for TSS should allow the system to return to the natural level of sediment to maintain the biological and aquatic community integrity.

Table 8. Calculation of TMDL, MOS and Current Condition Loads for January to June.

Subsegment	Description	Flow MGD	Jan-Jun TMDL Loading (lbs/day)	Jan-Jun MOS (lbs/day)	Jan-Jun LA (lbs/day)	Jan-Jun Ambient Stream Loading (lbs/day)	Jan-Jun Percent Reduction	Reasonable Assurance Percent Reduction
080102	Bayou Chauvin	59.3	19,782	3,956	15,826	33,769	53%	72%
080202	Bayou Louis	61	12,719	2,544	10,175	11,528	12%	90%
080401	Bayou Bartholomew	42	8,757	1,751	7,006	9,654	27%	90%
080901	Boeuf River	1110.7	370,530	74,106	296,424	889,086	67%	90%
080903	Big Creek	763.9	254,837	50,967	203,870	452,336	55%	92%
080904	Bayou Lafourche	961.4	320,723	64,145	256,578	763,241	66%	89%
081001	Bayou Macon	626.5	209,000	41,800	167,200	736,204	77%	89%
081002	Joe's Bayou	169.1	56,412	11,282	45,129	172,620	74%	87%
081201	Tensas River	2124.7	708,800	141,760	567,040	1,705,550	67%	90%
081202	Lake St. Joseph	196	40,866	8,173	32,693	87,666	63%	92%
081601	Little River- Castor Ck	222.8	46,454	9,291	37,163	41,901	11%	90%
081602	Little River- Bear Ck	353.1	73,621	14,724	58,897	108,753	46%	90%

Table 9. Calculation of TMDL, MOS and Current Condition Loads for July to December.

Subsegment	Description	Flow MGD	Jul-Dec TMDL Loading (lbs/day)	Jul-Dec MOS (lbs/day)	Jul-Dec LA (lbs/day)	Jul-Dec Ambient Stream Loading (lbs/day)	Jul-Dec Percent Reduction	Reasonable Assurance Percent Reduction
080102	Bayou Chauvin	12.6	5,675	1,135	4,540	12,855	65%	72%
080202	Bayou Louis	15.7	3,273	655	2,169	1,914	0%	90%
080401	Bayou Bartholomew	10.9	3,000	600	2,400	2,208	0%	90%
080901	Boeuf River	223.8	100,791	20,158	80,632	140,230	42%	90%
080903	Big Creek	151.3	68,139	13,628	54,512	70,285	22%	92%
080904	Bayou Lafourche	197.1	88,766	17,753	71,013	122,629	42%	89%
081001	Bayou Macon	124.5	56,070	11,214	44,856	105,411	57%	89%
081002	Joe's Bayou	33.5	15,087	3,017	12,070	10,617	0%	87%
081201	Tensas River	425.3	191,538	38,308	153,230	121,627	0%	90%
081202	Lake St. Joseph	38.8	10,679	2,136	8,543	15,921	46%	92%
081601	Little River- Castor Ck	44.1	12,137	2,427	9,710	7,474	0%	90%
081602	Little River- Bear Ck	75	20,642	4,128	16,513	22,255	26%	90%

3.3 Seasonal Variation

Section 303(d)(1) requires that all TMDLs be "established at a level necessary to implement the applicable water quality standard with seasonal variations". Seasonal variability was considered in calculating the current condition TSS values. A review of the data shows that, in general, values greater than the target values are more likely to occur in the months of January

through June. Because of this uneven distribution it was determined that two six month periods January to June and July to December would be used. The January to June, wet weather season, and the July to December, dry weather season, were used for establishing two target values, two current condition values, two TMDL values and two required percent reductions. The average of all data from these months was taken to represent the current condition for the nine non-scenic subsegments. The average of the last five years of record was taken to represent the current condition for the two scenic subsegments and subsegment 080401 Bayou Bartholomew. This seasonal approach is shown in paired Tables 6 and 7 as well as Tables 8 and 9. Graphs are provided in Appendix E.

3.4 Margin of Safety

The Clean Water Act requires that each TMDL be established with a MOS. This requirement for a MOS is intended to account for uncertainty in available data or in the actual effect controls will have on the loading reductions and receiving water quality. A MOS may be expressed explicitly as unallocated assimilative capacity or implicitly through conservative analytical assumptions used in establishing the TMDL. The MOS is not intended to compensate for failure to consider known sources. An explicit MOS of 20% is expressed in this TMDL and shown in Tables 8 and 9.

4. Reasonable Assurance and Other Relevant Information

LDEQ receives federal funding under the Clean Water Act Section 319(h) Nonpoint Source program. The Louisiana Nonpoint Source Management Plan identifies that the LDEQ will continue to work cooperatively with the federal, state and local partners that assist them in implementation of statewide educational programs and watershed protection and restoration projects to restore the designated uses of water bodies. The Management Plan also identifies the State's 14 short-term and long-term goals to address nonpoint sources of pollution in the Ouachita River Basin in the 2004 to 2015 timeframe. It is anticipated that the State will evaluate if actions have been successful in reducing the nonpoint source pollution in the Ouachita River Basin by the end of 2005. The Louisiana 2001 Nonpoint Source Annual Report (LDEQ,2002) indicates that actions have begun in the Ouachita River Basin based on completion of at least 5 TMDLs on dissolved oxygen. Fourteen projects are listed as implemented or initiated, which cover most of the BMPs needed in response to this TMDL. The annual report shows that 13 projects commit over $8 million in the Ouachita River Basin to reach the short-term and long-term goals. One of those projects is addressing the urban contribution of the Monroe/West Monroe area with a detention basin.

The Louisiana Nonpoint Source Management Plan under Cropland BMP's for sediment concerns in surface water lists 23 practices with 4 of them for irrigated fields. These will be instrumental in meeting the designated uses in the 9 subsegments where the cropland percentage ranges from 48% to 88%. The forestry BMPs fall under 4 large categories with 69 steps for the practices. These will be instrumental in meeting the designated uses in subsegment 080102 and the three Scenic subsegments which have 38% to 93% forested land, and a lesser impact in the 9 subsegments where the forested land percentage ranges from 3% to 28%. The pastureland BMPs for sediment concerns in surface water lists 16 practices with 3 of them for irrigated fields. The

13 subsegments average 6% pasture, which will make these a smaller contributor than cropland. The three parishes where the majority of the cattle are distributed may have an impact so they should be considered during implementation plan preparation.

Based on nonpoint source information gathered (Parsons, 2002) on the parishes effected by the 13 subsegments covered in this TMDL, an estimate was made of the existing extent of current practices. The General Watershed Loading Functions (GWLF) (Haith, 1996) that can be improved by implementing more fully the BMPs in the NPS management plan were selected based on this current condition assessment. The factors chosen were the runoff curve number based on practice, the cover and management factor and the support factor. A goal of 85% compliance and effectiveness was chosen. The values for the GWLF factors chosen were reduced to the 85% goal value. The factors were applied to the subsegments based on the percentage of the parish falling within the boundary of the subsegment and by the proportion of the land areas by land use. The data was summarized by subsegment to arrive at a reasonably achievable reduction target for each of the subsegments. The range of required TSS load reductions to meet the TMDL is 22% to 77%, and the range of reasonably achievable reduction is 69% to 92%. This provides a margin to increase the confidence that subsegments will return to meeting the standard and designated uses. The water entering three subsegments (080401, 080901 and 081001) from Arkansas is listed as impaired in Arkansas for siltation/turbidity. The implementation plans for the Arkansas TMDLs would reduce the amount of sediment entering Louisiana. That would lower the load reduction required within Louisiana. These computations are shown in Appendix H.

LDEQ utilizes funds under Section 106 of the Federal Clean Water Act and under the authority of the Louisiana Environmental Quality Act to operate an established program for permitting, enforcement and monitoring the quality of the State's surface waters. The LDEQ Surveillance Section collects surface water samples at various locations, utilizing appropriate sampling methods and procedures for ensuring the quality of the data collected. The objectives of the surface-water monitoring program are to determine the quality of the State's surface waters, to develop a long-term database for water quality trend analysis, and to monitor the effectiveness of pollution controls. The data obtained through the surface-water monitoring program is used to develop the State's biennial 305(b) report (*Water Quality Inventory*) and the 303(d) list of impaired waters. This information is also utilized in establishing priorities for the LDEQ nonpoint source program.

LDEQ has implemented a basin approach to surface water quality monitoring. Through this approach, the entire state is sampled over a five-year cycle with two targeted basins sampled each year. Long-term trend monitoring sites at various locations on the larger rivers and Lake Pontchartrain are sampled throughout the five-year cycle. Sampling is conducted on a monthly basis or more frequently if necessary to yield at least 12 samples per site each year. Sampling sites are located where they are considered to be representative of the water body. Under the current monitoring schedule, targeted basins follow the TMDL priorities. In this manner, the first TMDLs will have been established by the time the first priority basins are monitored again in the second five-year cycle. This will allow the LDEQ to determine whether there has been any improvement in water quality following establishment of the TMDLs. As the monitoring results are evaluated at the end of each year, waterbodies may be added to or removed from the

303(d) list. The sampling schedule for the first two five-year cycles is shown below. The Ouachita River Basin will be sampled again in 2004.

1998 – 2003 – Mermentau and Vermilion-Teche River Basins
1999 – 2004 – Calcasieu and Ouachita River Basins
2000 – 2005 – Barataria and Terrebonne Basins
2001 – 2006 – Lake Pontchartrain Basin and Pearl River Basin
2002 – 2007 – Red and Sabine River Basins

(Atchafalaya and Mississippi Rivers will be sampled continuously.)

5. Public Participation

When EPA establishes a TMDL, 40 CFR § 130.7(d)(2) requires EPA to publicly notice and seek comments concerning the TMDL. EPA prepared this TMDL pursuant to the consent decree, Sierra Club, et al. v. Clifford et al., No. 96-0527, (E.D. La.) signed and entered on April 1, 2002. Federal regulation requires that public notice be provided through the Federal Register and through newspapers in the local area. The Federal Register notice was issued on March 29, 2002 (Volume 67, Number 61, pages 15196 – 15198) for the 10 non-scenic subsegments. This TMDL was also noticed in local newspapers including The Times-Picayune (New Orleans- statewide), The Baton Rouge Advocate, The Advisor (Monroe, LA) and The News Star (Monroe, LA). No comments or additional information were submitted during the 30-day public comment period. The Federal Register notice was issued on April 22, 2002 (Volume 67, Number 77, pages 19575 – 19576) for the 3 scenic subsegments. This TMDL was also noticed in local newspapers including The Times-Picayune (New Orleans- statewide), The Lake Charles American Press and The News Star (Monroe, LA). One comment letter was submitted during the 30-day public comment period and appropriate changes were made in the final document. The comment letter and response can be found at the usual web page for Region 6 Federal Register Notices for finalized TMDLs, http://www.epa.gov/earth1r6/6wq/tmdlfinals.htm. EPA will provide notice that this TMDL has been made final, to the court, and to the Louisiana Department of Environmental Quality (LDEQ) and notification that it be incorporated into LDEQ's current water quality management plan.

Table 10. Public Participation

Action Item	Action Needed	Date
Federal Register Notice of Draft TMDL 10 non-scenic subsegments	Published	3/29/2002
Four Newspapers for Notice of Draft TMDL	Published	3/29/2002
End of Public Comment Period	End	4/29/2002
Federal Register Notice of Draft TMDL on 3 scenic subsegments	Published	4/22/2002
Three Newspapers for Notice of Draft TMDL	Published	4/22/2002
End of Public Comment Period	End	5/22/2002
Federal Register Notice of Final TMDL	Published	6/13/2002
Final TMDL to Court	Transmit	
Final TMDL to Louisiana Department of Environmental Quality (LDEQ)	Transmit	

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APPENDIX A: Land Use by Subsegment Sorted by % of Land Use

Bayou Chauvin - Headwaters to the Ouachita River 080102

Coverage Type	Area km2	Percent of Watershed
Pasture	28.29	30.05%
Mixed Forest	19.12	20.31%
Row Crops	14.58	15.48%
Urban	11.74	12.46%
Deciduous Forest	7.68	8.16%
Forested Wetlands	6.71	7.13%
Evergreen Forest	3.15	3.35%
Water	2.48	2.64%
Small Grains	0.29	0.31%
Other	0.12	0.12%
TOTAL	94.17	100%

Bayou Louis - Headwaters to Ouachita 080202

Coverage Type	Area km2	Percent of Watershed
Row Crops	60.49	64.76%
Deciduous Forest	11.57	12.39%
Forested Wetlands	6.44	6.89%
Mixed Forest	6.03	6.46%
Water	3.35	3.59%
Evergreen Forest	2.10	2.25%
Small Grains	1.73	1.85%
Pasture	1.40	1.50%
Urban	0.16	0.17%
Other	0.14	0.15%
Non Forested Wetlands	0.04	0.04%
TOTAL	93.41	100%

Boeuf River - Arkansas State Line to Ouachita River 080901

Coverage Type	Area km2	Percent of Watershed
Row Crops	986.90	60.12%
Forested Wetlands	259.33	15.80%
Small Grains	158.38	9.65%
Pasture	81.07	4.94%
Mixed Forest	69.76	4.25%
Water	41.49	2.53%
Deciduous Forest	29.38	1.79%
Evergreen Forest	10.45	0.64%
Urban	3.13	0.19%
Non Forested Wetlands	1.71	0.10%
Other	1.02	0.06%
TOTAL	1641.60	100%

Big Creek - Headwaters to Boeuf River (including Big 080903

Coverage Type	Area km2	Percent of Watershed
Row Crops	784.55	70.15%
Mixed Forest	123.11	11.01%
Small Grains	91.06	8.14%
Forested Wetlands	62.15	5.56%
Deciduous Forest	15.97	1.43%
Pasture	13.80	1.23%
Urban	10.06	0.90%
Water	9.07	0.81%
Evergreen Forest	8.62	0.77%
TOTAL	1118.40	100%

Bayou Lafourche - Near Oakridge to Boeuf River near 080904

Coverage Type	Area km2	Percent of Watershed
Row Crops	590.72	40.37%
Forested Wetlands	253.12	17.30%
Pasture	177.99	12.16%
Small Grains	108.44	7.41%
Mixed Forest	102.88	7.03%
Urban	75.33	5.15%
Evergreen Forest	64.30	4.39%
Deciduous Forest	54.46	3.72%
Water	32.21	2.20%
Other	3.74	0.26%
Non Forested Wetlands	2.72	0.19%
TOTAL	1463.19	100%

Clear Lake 080910

Coverage Type	Area km2	Percent of Watershed
Row Crops	4.84	86.60%
Water	0.41	7.30%
Mixed Forest	0.15	2.64%
Small Grains	0.10	1.87%
Pasture	0.05	0.95%
Deciduous Forest	0.01	0.24%
Forested Wetlands	0.01	0.24%
Evergreen Forest	0.01	0.16%
TOTAL	5.59	100%

Bayou Macon - Arkansas State Line to Tensas River 081001

Coverage Type	Area km2	Percent of Watershed
Row Crops	604.19	65.86%
Small Grains	116.99	12.75%
Mixed Forest	53.43	5.82%
Pasture	50.74	5.53%
Forested Wetlands	45.38	4.95%
Deciduous Forest	17.47	1.90%
Water	15.30	1.67%
Evergreen Forest	8.48	0.92%
Urban	5.10	0.56%
Other	0.27	0.03%
Non Forested Wetlands	0.04	0.00%
TOTAL	917.34	100%

Joe's Bayou - Headwaters to Bayou Macon 081002

Coverage Type	Area km2	Percent of Watershed
Row Crops	140.02	56.59%
Small Grains	62.30	25.18%
Pasture	22.89	9.25%
Mixed Forest	7.46	3.02%
Evergreen Forest	5.08	2.05%
Water	4.73	1.91%
Forested Wetlands	2.64	1.07%
Deciduous Forest	2.15	0.87%
Urban	0.14	0.06%
Non Forested Wetlands	0.02	0.01%
TOTAL	247.44	100%

Tensas River - Headwaters to Jonesville (including 081201

Coverage Type	Area km2	Percent of Watershed
Row Crops	1946.49	62.50%
Forested Wetlands	707.15	22.71%
Small Grains	166.44	5.34%
Pasture	148.48	4.77%
Water	42.24	1.36%
Mixed Forest	25.32	0.81%
Non Forested Wetlands	25.15	0.81%
Deciduous Forest	24.98	0.80%
Urban	15.90	0.51%
Evergreen Forest	12.21	0.39%
Other	1.04	0.03%
TOTAL	3114.35	100%

Lake St. Joseph (Oxbow Lake)		081202
Coverage Type	**Area km2**	**Percent of Watershed**
Row Crops	190.67	66.46%
Forested Wetlands	68.19	23.77%
Pasture	7.62	2.66%
Water	6.69	2.33%
Small Grains	6.29	2.19%
Mixed Forest	2.68	0.93%
Urban	1.73	0.60%
Non Forested Wetlands	1.30	0.45%
Deciduous Forest	1.12	0.39%
Evergreen Forest	0.60	0.21%
TOTAL	286.89	100%

Summary of Non-Scenic Subsegments

Coverage Type	**Area km2**	**Percent of Watershed**
Row Crops	5323.44	59.27%
Forested Wetlands	1411.14	15.71%
Small Grains	712.02	7.93%
Pasture	532.34	5.93%
Mixed Forest	409.94	4.56%
Deciduous Forest	164.79	1.83%
Water	157.98	1.76%
Urban	123.29	1.37%
Evergreen Forest	115.00	1.28%
Non Forested Wetlands	30.98	0.34%
Other	6.33	0.07%
TOTAL	8982.38	100.05%

Bayou Bartholomew - Arkansas State Line to Dead B		80401
Coverage Type	**Area km2**	**Percent of Watershed**
Evergreen Forest	104.70	32.19%
Pasture	59.25	18.22%
Mixed Forest	53.39	16.41%
Row Crops	36.44	11.20%
Forested Wetlands	26.99	8.30%
Deciduous Forest	24.02	7.39%
Urban	9.51	2.93%
Small Grains	5.55	1.71%
Water	4.31	1.33%
Other	1.08	0.33%
TOTAL	325.25	100%

Little River - Confluence of Castor Creek and Dugder 081601

Coverage Type	Area km2	Percent of Watershed
Deciduous Forest	16.22	25.14%
Mixed Forest	13.26	20.54%
Forested Wetlands	12.49	19.36%
Evergreen Forest	12.14	18.82%
Other	4.81	7.45%
Water	3.03	4.69%
Pasture	1.15	1.78%
Urban	0.83	1.28%
Row Crops	0.61	0.95%
TOTAL	64.54	100%

Little River - From Bear Creek to Catahoula Lake (Sc 081602

Coverage Type	Area km2	Percent of Watershed
Evergreen Forest	282.74	43.73%
Mixed Forest	117.46	18.17%
Forested Wetlands	101.44	15.69%
Deciduous Forest	94.08	14.55%
Other	25.85	4.00%
Water	13.23	2.05%
Pasture	6.84	1.06%
Row Crops	2.60	0.40%
Urban	1.59	0.25%
Non Forested Wetlands	0.67	0.10%
TOTAL	646.49	100%

Summary of Scenic Subsegments

Coverage Type	Area km2	Percent of Watershed
Evergreen Forest	399.58	38.56%
Mixed Forest	184.11	17.77%
Forested Wetlands	140.93	13.60%
Deciduous Forest	134.32	12.96%
Pasture	67.23	6.49%
Row Crops	39.65	3.83%
Other	31.74	3.06%
Water	20.57	1.98%
Urban	11.93	1.15%
Small Grains	5.55	0.54%
Non Forested Wetlands	0.67	0.06%
TOTAL	1036.29	100.00%

Summary of All Subsegments

Coverage Type	Area km2	Percent of Watershed
Row Crops	5363.09	53.53%
Forested Wetlands	1552.07	15.49%
Small Grains	717.58	7.16%
Pasture	599.57	5.98%
Mixed Forest	594.05	5.93%
Evergreen Forest	514.58	5.14%
Deciduous Forest	299.11	2.99%
Water	178.54	1.78%
Urban	135.22	1.35%
Other	38.07	0.38%
Non Forested Wetlands	31.65	0.32%
TOTAL	10018.67	100.00%

APPENDIX B: Ambient Monitoring Data

Period of Record for Monitoring Stations

Station	Description of the Monitoring Location	Period of Record
0016	Boeuf River near Ft. Necessity, LA	1958 -1999
0025	Little River S of Rogers, LA	1995-1999
0069	Big Creek near Winnsboro, LA	1978-1999
0071	Bayou Lafourche Canal near Columbia, LA	1978-1999
0074	Bayou Bartholomew near Bastrop, LA	1995-1999
0089	Little River SW of Jena, LA	1995-1999
0124	Bayou Lafourche Canal near Crew Lake, LA	1982-1998
0159	Tensas River at Clayton, LA	1988-2001
0327	Boeuf River West of Rayville, LA	1991-1998
0327	Big Creek East of Rayville, LA	1991-1998
0329	Bayou Macon East of Oak Grove, LA	1991-1998
0330	Bayou Macon Southwest of Winnsborro, LA	1991-1998
0771	Bayou Chauvin at control structure on Ouachita River Levee N of Monroe, LA	1999
0773	Bayou Louis East of Harrisonburg, LA	1999
0797	Joe's Bayou Southeast of Delhi, LA	1999
0799	Tensas River at Jonesville, LA	1999
0800	Lake St. Joseph in Newellton, LA	1999
0808	Little River at Georgetown, LA	1994-1998
0809	Little River NE of Ball, LA	1995-1999

Number of Impaired Records for Turbidity by Station during the Wet Season (Jan - June) (based on all data)

Station	Description	Number of Total Records	Number of Impaired Records	Impaired %
0016	Boeuf River	125	110	88%
0025	Little River	29	9	31%
0069	Big Creek	115	84	73%
0089	Little River	29	9	31%
0124	Bayou Lafourche	169	154	91%
0159	Tensas River	59	51	86%
0325	Bayou Bartholomew	12	4	33%
0329	Bayou Macon	46	31	67%
0771	Bayou Chauvin	6	1	17%
0773	Bayou Louis	6	4	67%
0797	Joe's Bayou	6	6	100%
0800	Lake St. Joseph	6	6	100%
0808	Little River	12	6	50%
0809	Little River	5	3	60%

Number of Impaired Records for Turbidity by Station during the Dry Season (July - Dec) (based on all data)

Station	Description	Number of Total Records	Number of Impaired Records	Impaired %
0025	Little River	24	13	54%
0071	Bayou Lafourche	168	81	48%
0089	Little River	23	7	30%
0159	Tensas River	63	14	22%
0325	Bayou Bartholomew	9	3	33%
0327	Big Creek	113	35	31%
0327	Boeuf River	119	59	50%
0330	Bayou Macon	42	20	48%
0771	Bayou Chauvin	6	6	100%
0773	Bayou Louis	6	0	0%
0797	Joe's Bayou	2	1	50%
0800	Lake St. Joseph	6	6	100%
0808	Little River	12	6	50%
0809	Little River	6	2	33%

Turbidity Statistics - Jan - Jun (modified data)

Subsegment	Station(s)	Description	N	Mean	Median	Min	Max	Stdev
080102	0771	Bayou Chauvin - Headwaters to the Ouachita R	6	73.17	36.5	18	288	105.66
080202	0773	Bayou Louis - Headwaters to the Ouachita R	5	53.6	60	20	95	31.97
080401*	0074	Bayou Bartholomew-Arkansas State Line to Dead Bayou	17	54.59	45	26	121	28.06
080901	016,0327	Boeuf River - Arkansas State Line to Ouachita R	116	139.58	124.5	9.8	384	83.09
080903	069,0327	Big Creek - Headwaters to Boeuf R (inc. Big Colewa B)	106	96.04	83	9	370	64.45
080904	071,0124	Bayou Lafourche-nr Oakridge to Boeuf R nr Columbia	160	150.08	135	17	432	81.42
081001	0329,0330	Bayou Macon - Arkansas State Line to Tensas R	42	109.02	83.5	12	351	92.9
081002	0979	Joe's Bayou Headwaters to Bayou Macon	5	370	400	270	450	89.16
081201	0159,0799	Tensas R -Headwaters to Jonesville (inc. Tensas B)	57	157.94	140	8.5	400	101.07
081202	0800	Lake St. Joseph (Oxbow Lake)	6	83.5	72.5	36	150	47.51
081601*	0808	Little River-Castor Creek & Dugdemona R to Bear Creek	6	29.75	28.25	22	45	8.34
081602*	0025, 0089, 0809	Little River - Bear Creek to Catahoula Lake	63	25.16	20	4	110	15.99

TSS Descriptive Statistics - Jan - Jun (modified data)

Subsegment	Station(s)	Description	N	Mean	Median	Min	Max	Stdev
080102	0771	Bayou Chauvin - Headwaters to the Ouachita R	6	68.28	24.35	10	288	108.44
080202	0773	Bayou Louis - Headwaters to the Ouachita R	5	22.66	24.7	11	34	9.9
080401*	0074	Bayou Bartholomew-Arkansas State Line to Dead Bayou	17	27.56	22	10	111	24.03
080901	016,0327	Boeuf River - Arkansas State Line to Ouachita R	116	95.98	65	7	412	88.1
080903	069,0327	Big Creek - Headwaters to Boeuf R (inc. Big Colewa B)	106	71	52	9	280	53.95
080904	071,0124	Bayou Lafourche-nr Oakridge to Boeuf R nr Columbia	160	95.19	76	8	348	69.55
081001	0329,0330	Bayou Macon - Arkansas State Line to Tensas R	42	140.9	102	15	412	113.69
081002	0979	Joe's Bayou Headwaters to Bayou Macon	5	122.4	137	66	179	47.85
081201	0159,0799	Tensas R -Headwaters to Jonesville (inc. Tensas B)	57	96.25	58	7	432	93.26
081202	0800	Lake St. Joseph (Oxbow Lake)	6	53.63	45.4	30	91	23.74
081601*	0808	Little River-Castor Creek & Dugdemona R to Bear Creek	6	22.55	29.65	18	48	12.7
081602*	0025, 0089, 0809	Little River - Bear Creek to Catahoula Lake	63	36.93	19	2	767	96.08

* descriptive stats for last five years of data only

Turbidity Statistics - Jul - Dec (modified data)

Subsegment	Station(s)	Description	N	Mean	Median	Min	Max	Stdev
080102	0771	Bayou Chauvin - Headwaters to the Ouachita R	6	92.5	82.5	55	160	40.84
080202	0773	Bayou Louis - Headwaters to the Ouachita R	6	15.2	15.2	7.2	25	7.82
080401*	0074	Bayou Bartholomew-Arkansas State Line to Dead Bayou	15	25.65	22	3.2	60	16.17
080901	016,0327	Boeuf River - Arkansas State Line to Ouachita R	114	66.71	52.5	9	240	54.8
080903	069,0327	Big Creek - Headwaters to Boeuf R (inc. Big Colewa B)	108	53.72	32.5	9.5	300	57.92
080904	071,0124	Bayou Lafourche-nr Oakridge to Boeuf R nr Columbia	165	73.04	50	10	396	67.11
081001	0329,0330	Bayou Macon - Arkansas State Line to Tensas R	40	71.99	47.5	11	252	61.93
081002	0979	Joe's Bayou Headwaters to Bayou Macon	2	82.5	82.5	45	120	53.03
081201	0159,0799	Tensas R -Headwaters to Jonesville (inc. Tensas B)	51	47.43	18	7.9	260	63.53
081202	0800	Lake St. Joseph (Oxbow Lake)	5	37.2	32	29	50	9.63
081601*	0808	Little River-Castor Creek & Dugdemona R to Bear Creek	6	25.5	24	12	40	9.85
081602*	0025, 0089, 0809	Little River - Bear Creek to Catahoula Lake	53	26.2	25	6.5	65	11.7

TSS Descriptive Statistics - Jul - Dec (modified data)

Subsegment	Station(s)	Description	N	Mean	Median	Min	Max	Stdev
080102	0771	Bayou Chauvin - Headwaters to the Ouachita R	6	122.33	118	52	224	67.15
080202	0773	Bayou Louis - Headwaters to the Ouachita R	6	14.62	13.25	5.3	26.4	7.97
080401*	0074	Bayou Bartholomew-Arkansas State Line to Dead Bayou	15	24.29	26	5	42	11.97
080901	016,0327	Boeuf River - Arkansas State Line to Ouachita R	114	75.13	53.5	8	332	63.96
080903	069,0327	Big Creek - Headwaters to Boeuf R (inc. Big Colewa B)	108	55.7	40	12	284	45.91
080904	071,0124	Bayou Lafourche-nr Oakridge to Boeuf R nr Columbia	165	74.6	50	10	345	72.76
081001	0329,0330	Bayou Macon - Arkansas State Line to Tensas R	40	101.52	79.5	11.3	360	72.84
081002	0979	Joe's Bayou Headwaters to Bayou Macon	2	38	38	28	48	14.14
081201	0159,0799	Tensas R -Headwaters to Jonesville (inc. Tensas B)	51	34.29	26	7.3	186	31.93
081202	0800	Lake St. Joseph (Oxbow Lake)	5	49.2	44	28	88	23.56
081601*	0808	Little River-Castor Creek & Dugdemona R to Bear Creek	6	20.32	18.5	12.4	33	7.73
081602*	0025, 0089, 0809	Little River - Bear Creek to Catahoula Lake	53	35.58	29	7	246	34.59

* Descriptive stats for last five years of data only

January to June Data Set

Station	Date	Turbidity	TSS
0016	3/7/1978	110	150
0016	4/12/1978	130	130
0016	6/13/1978	200	204
0016	1/9/1979	145	160
0016	2/13/1979	160	96
0016	3/13/1979	245	196
0016	4/17/1979	250	266
0016	1/15/1980	140	142
0016	2/12/1980	200	276
0016	3/11/1980	82	174
0016	4/15/1980	175	308
0016	5/13/1980	275	160
0016	1/13/1981	20	62
0016	2/9/1981	88	154
0016	3/10/1981	98	110
0016	4/13/1981	63	102
0016	1/11/1982	115	120
0016	2/8/1982	90	144
0016	3/8/1982	140	100
0016	4/12/1982	135	132
0016	5/10/1982	300	112
0016	6/15/1982	87	96
0016	1/10/1983	78	22
0016	2/7/1983	120	76
0016	3/14/1983	85	44
0016	4/11/1983	330	250
0016	5/9/1983	145	78
0016	6/13/1983	94	38
0016	1/9/1984	80	26
0016	3/12/1984	245	92
0016	1/14/1985	57	10
0016	2/11/1985	363	280
0016	3/11/1985	152	34
0016	4/8/1985	384	76
0016	5/13/1985	288	73
0016	6/10/1985	50	56
0016	1/13/1986	81.3	52
0016	2/18/1986	120	38
0016	3/18/1986	102	78
0016	4/15/1986	374	386
0016	5/13/1986	163	52
0016	6/10/1986	192	184
0016	1/13/1987	96	52
0016	2/17/1987	180	236
0016	3/10/1987	80	16
0016	4/14/1987	88	80
0016	5/12/1987	228	252
0016	6/9/1987	135	198
0016	1/12/1988	60	32
0016	2/9/1988	90	32
0016	3/15/1988	130	72
0016	4/12/1988	228	60
0016	5/10/1988	65	58
0016	6/14/1988	18	30
0016	1/9/1989	140	50
0016	2/14/1989	33	44
0016	3/13/1989	90	28
0016	4/10/1989	137	50
0016	5/8/1989	204	152
0016	6/12/1989	240	164
0016	1/8/1990	290	412
0016	2/12/1990	180	220
0016	3/12/1990	208	30
0016	4/9/1990	165	62
0016	5/14/1990	248	290
0016	6/11/1990	145	44
0016	2/4/1991	68	22
0016	4/16/1991	342	376
0016	6/10/1991	34	15
0016	2/10/1992	128	90
0016	4/6/1992	124	60
0016	6/15/1992	105	18
0016	2/8/1993	66	34
0016	4/12/1993	190	140
0016	6/14/1993	38	48
0016	2/7/1994	110	54
0016	4/11/1994	110	41
0016	6/13/1994	175	132
0016	2/13/1995	90	29
0016	4/3/1995	90	40
0016	6/12/1995	100	38
0016	2/12/1996	340	308
0016	4/8/1996	210	124
0016	6/10/1996	93	86
0016	2/17/1997	120	74
0016	4/14/1997	162	24
0016	6/9/1997	160	68
0016	2/9/1998	85	30
0016	4/13/1998	75	18
0016	2/3/1999	160	111
0016	3/3/1999	95	38
0016	4/7/1999	220	47
0016	6/2/1999	110	84
0025	1/10/1994	20	16
0025	2/7/1994	40	39
0025	3/14/1994	20	13
0025	4/12/1994	28	91
0025	5/9/1994	15	29
0025	6/14/1994	18	13
0025	1/10/1995	60	48
0025	2/13/1995	29	5
0025	3/13/1995	45	91
0025	4/3/1995	15	10
0025	5/8/1995	22	17
0025	6/12/1995	4	8.5
0025	1/9/1996	20	12
0025	2/12/1996	22	11
0025	3/12/1996	11	10
0025	4/8/1996	8.6	49
0025	5/13/1996	20	9
0025	1/7/1997	25	20
0025	2/18/1997	30	33.3
0025	3/10/1997	18	11
0025	4/15/1997	15	K 4.0
0025	5/13/1997	22	28
0025	6/10/1997	55	52
0025	1/13/1998	35	31
0025	2/9/1998	22	20
0025	3/10/1998	45	34
0025	4/14/1998	13	10
0025	5/12/1998	15	13
0069	3/7/1978	87	82
0069	4/12/1978	35	58
0069	6/13/1978	200	252
0069	1/9/1979	40	76
0069	5/13/1980	137	162
0069	2/9/1981	89	90
0069	3/10/1981	65	96
0069	4/13/1981	83	134
0069	5/12/1981	60	144
0069	1/11/1982	42	40
0069	2/8/1982	180	196
0069	3/8/1982	97	76
0069	4/12/1982	115	96
0069	5/10/1982	92	104
0069	6/15/1982	90	160
0069	1/10/1983	65	20
0069	2/7/1983	110	80
0069	3/14/1983	45	26
0069	4/11/1983	200	132
0069	5/9/1983	64	68
0069	6/13/1983	72	20
0069	1/9/1984	48	28

January to June Data Set - continued

Station	Date	Turbidity	TSS
0069	3/12/1984	170	68
0069	5/14/1984	370	44
0069	6/11/1984	340	112
0069	3/11/1985	114	42
0069	5/13/1985	80	64
0069	6/10/1985	38	40
0069	1/13/1986	28	38
0069	2/18/1986	51	48
0069	3/18/1986	22	40
0069	4/15/1986	240	216
0069	5/13/1986	110	84
0069	6/10/1986	155	280
0069	1/13/1987	120	32
0069	2/17/1987	117	100
0069	3/10/1987	60	38
0069	4/14/1987	53	92
0069	5/12/1987	252	212
0069	1/12/1988	37	26
0069	2/9/1988	80	24
0069	3/15/1988	83	50
0069	4/12/1988	94	56
0069	5/10/1988	22	82
0069	6/14/1988	18	40
0069	1/10/1989	96	60
0069	2/14/1989	50	34
0069	3/13/1989	44	20
0069	4/10/1989	53	42
0069	5/8/1989	195	108
0069	6/12/1989	88	44
0069	1/8/1990	160	184
0069	2/12/1990	160	136
0069	3/12/1990	66	42
0069	4/9/1990	93	30
0069	6/11/1990	74	28
0069	1/15/1991	80	44
0069	3/12/1991	40	28
0069	1/7/1992	16	24
0069	3/10/1992	76	64
0069	5/12/1992	30	40
0069	1/12/1993	76	44
0069	3/9/1993	75	40
0069	5/11/1993	47	76
0069	1/11/1994	45	29
0069	3/15/1994	60	36
0069	5/10/1994	200	110
0069	1/10/1995	140	102
0069	3/14/1995	160	16
0069	5/9/1995	120	36
0069	1/9/1996	175	152
0069	3/12/1996	11	27
0069	5/14/1996	84	86
0069	1/7/1997	105	63
0069	3/11/1997	45	17
0069	5/13/1997	182	18
0069	1/13/1998	102	48
0069	3/10/1998	150	74
0069	5/12/1998	40	59
0069	2/3/1999	65	41
0069	3/3/1999	45	41
0069	4/7/1999	130	60
0069	6/2/1999	240	158
0071	3/7/1978	102	102
0071	4/12/1978	175	162
0071	6/13/1978	175	192
0071	1/9/1979	100	310
0071	5/13/1980	195	120
0071	1/13/1981	17	78
0071	2/9/1981	95	98
0071	3/10/1981	63	196
0071	4/13/1981	50	130
0071	5/12/1981	78	150
0071	6/9/1981	150	202
0071	1/11/1982	34	48
0071	2/8/1982	120	92
0071	3/8/1982	260	212
0071	4/12/1982	275	348
0071	5/10/1982	93	20
0071	6/15/1982	140	228
0071	1/10/1983	100	22
0071	2/7/1983	190	210
0071	3/14/1983	120	92
0071	4/11/1983	310	190
0071	5/9/1983	210	112
0071	6/13/1983	130	24
0071	1/9/1984	60	32
0071	3/12/1984	231	76
0071	1/14/1985	60	16
0071	3/11/1985	190	24
0071	4/8/1985	352	80
0071	5/13/1985	170	40
0071	6/10/1985	21	16
0071	1/13/1986	78	34
0071	2/18/1986	210	54
0071	3/18/1986	105	70
0071	4/15/1986	213	156
0071	5/13/1986	68	30
0071	6/10/1986	270	180
0071	1/13/1987	105	52
0071	2/17/1987	216	344
0071	3/10/1987	83	32
0071	4/14/1987	98	92
0071	5/12/1987	109	88
0071	6/9/1987	135	124
0071	1/12/1988	75	44
0071	2/9/1988	130	44
0071	3/15/1988	180	150
0071	5/10/1988	50	60
0071	6/14/1988	17	12
0071	1/10/1989	152	50
0071	2/14/1989	114	36
0071	3/13/1989	90	22
0071	4/10/1989	140	66
0071	5/8/1989	155	52
0071	6/12/1989	195	116
0071	1/8/1990	120	100
0071	2/12/1990	160	98
0071	3/12/1990	100	40
0071	4/9/1990	175	16
0071	5/14/1990	180	180
0071	6/11/1990	74	9
0071	2/4/1991	90	28
0071	4/16/1991	224	128
0071	6/10/1991	30	8
0071	2/10/1992	150	72
0071	4/6/1992	117	58
0071	6/15/1992	190	180
0071	2/8/1993	72	38
0071	4/12/1993	216	184
0071	6/14/1993	32	64
0071	2/7/1994	130	46
0071	4/11/1994	160	32
0071	6/13/1994	68	85
0071	2/13/1995	130	44
0071	4/3/1995	90	42
0071	6/12/1995	63	39
0071	2/12/1996	300	224
0071	4/8/1996	210	168
0071	6/10/1996	61	72
0071	2/17/1997	114	72
0071	4/14/1997	210	56
0071	6/9/1997	236	104
0071	2/9/1998	95	30
0071	4/13/1998	90	32
0071	1/6/1999	370	240

January to June Data Set - continued

Station	Date	Turbidity	TSS
0071	2/3/1999	170	78
0071	3/3/1999	75	50.7
0071	4/7/1999	270	175
0071	6/2/1999	90	76
0074	2/14/1995	55	12
0074	4/4/1995	40	14
0074	6/13/1995	27	31.5
0074	2/13/1996	120	30
0074	4/9/1996	60	42
0074	6/11/1996	32	18
0074	2/18/1997	40	13.5
0074	4/15/1997	35	10
0074	6/10/1997	121	111
0074	2/10/1998	50	14
0074	4/14/1998	70	31
0074	1/12/1999	45	22
0074	2/9/1999	26	10
0074	3/9/1999	40	32.5
0074	4/13/1999	45	10
0074	5/11/1999	50	40
0074	6/8/1999	72	27
0076	1/10/1994	10	8
0076	2/7/1994	22	7
0076	3/14/1994	20	7
0076	4/11/1994	23	20
0076	5/9/1994	65	122
0076	6/13/1994	21	23
0076	1/9/1995	34	23
0076	2/13/1995	21	5
0076	3/14/1995	26	49
0076	4/4/1995	24	12
0076	5/8/1995	22	21
0076	6/12/1995	22	8.7
0076	1/9/1996	20	15
0076	2/12/1996	18	8
0076	3/11/1996	10	3
0076	4/8/1996	13	18
0076	5/13/1996	22	10
0076	6/10/1996	19	23
0076	1/6/1997	25	31
0076	2/17/1997	25	13
0076	3/10/1997	20	7
0076	4/15/1997	24	15
0076	5/13/1997	29	22
0076	6/9/1997	30	19
0076	1/13/1998	24	9
0076	2/9/1998	24	22
0076	3/9/1998	36	26
0076	4/13/1998	26	24
0076	5/11/1998	30	22
0089	1/10/1994	20	40
0089	2/7/1994	25	22
0089	3/14/1994	24	16
0089	4/12/1994	17	9
0089	5/9/1994	27	20
0089	6/14/1994	15	20
0089	1/10/1995	40	30
0089	2/13/1995	32	15
0089	3/13/1995	31	23
0089	4/3/1995	19	14
0089	5/8/1995	19	14
0089	6/12/1995	15	14
0089	1/9/1996	35	39
0089	2/12/1996	20	11
0089	3/12/1996	13	26
0089	4/8/1996	11	36
0089	5/13/1996	11	2
0089	6/10/1996	6.1	10
0089	1/7/1997	25	19.5
0089	2/18/1997	45	36.6
0089	3/10/1997	20	11
0089	4/15/1997	16	6
0089	5/13/1997	19	16
0089	6/10/1997	41	36
0089	1/13/1998	34	33
0089	2/9/1998	24	19
0089	3/10/1998	45	36
0089	4/14/1998	17	12
0089	5/12/1998	21	14
0124	2/8/1982	330	240
0124	3/9/1982	140	42
0124	4/13/1982	220	70
0124	5/11/1982	150	70
0124	6/14/1982	100	260
0124	1/10/1983	135	80
0124	2/8/1983	170	168
0124	3/14/1983	94	76
0124	4/11/1983	230	100
0124	5/10/1983	140	80
0124	6/14/1983	120	56
0124	1/9/1984	58	36
0124	3/12/1984	198	56
0124	6/11/1984	432	144
0124	1/14/1985	64	38
0124	2/11/1985	288	180
0124	3/11/1985	210	64
0124	4/8/1985	330	96
0124	5/13/1985	90	44
0124	6/10/1985	34	68
0124	1/13/1986	116	14
0124	2/18/1986	158	34
0124	3/18/1986	36	52
0124	4/15/1986	110	148
0124	5/13/1986	21	36
0124	6/10/1986	380	86
0124	1/13/1987	132	48
0124	2/17/1987	210	248
0124	3/10/1987	120	72
0124	4/14/1987	90	72
0124	5/12/1987	117	124
0124	6/9/1987	128	48
0124	1/12/1988	85	40
0124	2/9/1988	95	52
0124	3/15/1988	180	140
0124	4/12/1988	222	80
0124	5/10/1988	50	54
0124	6/14/1988	27	40
0124	1/10/1989	180	100
0124	2/14/1989	133	28
0124	3/13/1989	216	80
0124	4/10/1989	304	144
0124	5/8/1989	195	108
0124	6/12/1989	148	100
0124	1/8/1990	190	192
0124	2/12/1990	270	160
0124	3/12/1990	185	152
0124	4/9/1990	256	248
0124	6/11/1990	90	50
0124	1/15/1991	160	80
0124	3/12/1991	156	94
0124	5/13/1991	136	90
0124	1/7/1992	48	30
0124	3/10/1992	264	300
0124	5/12/1992	99	104
0124	1/12/1993	92	59
0124	3/9/1993	228	66
0124	5/11/1993	126	60
0124	1/11/1994	106	38
0124	3/15/1994	140	84
0124	5/10/1994	230	54
0124	1/10/1995	190	92
0124	3/14/1995	130	58
0124	5/9/1995	110	50
0124	1/9/1996	225	136

January to June Data Set - continued

Station	Date	Turbidity	TSS
0124	3/12/1996	140	50
0124	5/14/1996	216	118
0124	1/7/1997	228	88
0124	3/11/1997	120	88
0124	5/13/1997	175	84
0124	1/13/1998	247	170
0124	3/10/1998	330	90
0124	5/12/1998	24	31
0159	1/10/1989	174	116
0159	2/14/1989	80	16
0159	3/14/1989	148	30
0159	4/11/1989	99	42
0159	5/9/1989	315	220
0159	6/13/1989	252	200
0159	1/9/1990	120	160
0159	2/13/1990	230	288
0159	3/13/1990	132	36
0159	4/10/1990	80	20
0159	5/14/1990	259	432
0159	6/11/1990	140	34
0159	2/5/1991	128	52
0159	6/10/1991	42	7
0159	2/10/1992	126	74
0159	4/6/1992	85	58
0159	6/15/1992	80	90
0159	2/8/1993	80	38
0159	4/12/1993	170	32
0159	6/14/1993	40	28
0159	2/8/1994	250	154
0159	4/12/1994	150	70
0159	6/14/1994	30	38
0159	2/14/1995	120	32
0159	5/9/1995	140	66
0159	6/13/1995	105	32
0159	2/13/1996	220	174
0159	4/9/1996	400	386
0159	6/11/1996	105	76
0159	2/18/1997	210	188
0159	2/9/1998	180	92
0159	4/14/1998	110	36
0159	6/8/1998	120	103
0159	1/13/1999	400	224
0159	2/10/1999	210	68
0159	3/10/1999	300	200
0159	4/14/1999	230	50
0159	5/12/1999	150	46
0159	6/9/1999	59	39
0159	1/11/2000	26	30
0159	2/8/2000	8.5	14.4
0159	3/14/2000	65	268
0159	4/11/2000	190	86
0159	5/9/2000	70	17
0159	6/13/2000	39	39
0159	1/9/2001	380	92
0159	2/13/2001	350	92
0159	3/13/2001	190	45.5
0159	4/10/2001	90	22.4
0159	5/8/2001	95	30
0159	6/5/2001	10	26
0327	1/15/1991	80	40
0327	1/15/1991	210	116
0327	3/12/1991	64	38
0327	3/12/1991	44.4	34
0327	5/13/1991	85	50
0327	5/13/1991	180	48
0327	1/7/1992	40.8	25
0327	1/7/1992	9.8	8
0327	3/10/1992	155	130
0327	5/12/1992	9	9
0327	5/12/1992	10	12
0327	1/12/1993	88	59
0327	1/12/1993	62	9
0327	3/9/1993	89	45
0327	3/9/1993	120	14
0327	5/11/1993	42	39
0327	5/11/1993	70	16
0327	1/11/1994	72	30
0327	1/11/1994	12	7
0327	3/15/1994	75	64
0327	3/15/1994	160	86
0327	5/10/1994	90	31
0327	5/10/1994	14	14
0327	1/10/1995	100	54
0327	1/10/1995	210	68
0327	3/14/1995	130	76
0327	3/14/1995	160	90
0327	5/9/1995	110	64
0327	5/9/1995	50	19
0327	1/9/1996	120	94
0327	1/9/1996	105	59
0327	3/12/1996	20	33
0327	3/12/1996	10	10
0327	5/14/1996	136	130
0327	5/14/1996	43	10
0327	1/7/1997	175	204
0327	1/7/1997	156	18
0327	3/11/1997	50	34
0327	3/11/1997	120	58
0327	5/13/1997	72	26
0327	5/13/1997	125	20
0327	1/13/1998	102	68
0327	1/13/1998	166	56
0327	3/10/1998	120	62
0327	3/10/1998	170	80
0327	5/12/1998	22	22
0329	2/4/1991	19	47
0329	6/11/1991	76	154
0329	2/11/1992	108	126
0329	4/7/1992	40	132
0329	6/16/1992	119	220
0329	2/9/1993	16	38
0329	4/13/1993	150	108
0329	6/15/1993	85	180
0329	2/8/1994	110	148
0329	6/14/1994	82	192
0329	2/14/1995	12	15
0329	4/4/1995	25	65
0329	6/13/1995	240	412
0329	2/13/1996	26	27
0329	4/9/1996	16	34
0329	6/11/1996	45	130
0329	2/18/1997	120	164
0329	4/15/1997	30	70
0329	6/10/1997	273	288
0329	2/10/1998	60	116
0329	4/14/1998	36	46
0330	2/5/1991	70	80
0330	6/11/1991	128	68
0330	2/11/1992	222	146
0330	4/7/1992	140	204
0330	6/16/1992	351	410
0330	2/9/1993	31	36
0330	4/13/1993	155	92
0330	6/15/1993	60	96
0330	2/8/1994	130	48
0330	4/12/1994	350	392
0330	6/14/1994	120	230
0330	2/14/1995	18	38
0330	4/4/1995	50	84
0330	6/13/1995	225	408
0330	2/13/1996	70	90
0330	4/9/1996	320	368
0330	6/11/1996	31	80
0330	2/18/1997	180	130

January to June Data Set - continued

Station	Date	Turbidity	TSS
0330	4/15/1997	25	26
0330	2/10/1998	130	86
0330	4/14/1998	85	94
0771	1/19/1999	35	22
0771	2/16/1999	18	15
0771	3/16/1999	40	26.7
0771	4/20/1999	20	10
0771	5/18/1999	38	48
0771	6/15/1999	288	288
0773	1/13/1999	70	34
0773	2/10/1999	60	24.7
0773	3/10/1999	95	29.6

Station	Date	Turbidity	TSS
0773	5/12/1999	20	11
0773	6/9/1999	23	14
0797	1/5/1999	400	80
0797	3/2/1999	450	150
0797	4/6/1999	450	137
0797	5/4/1999	270	179
0797	6/1/1999	280	66
0799	1/5/1999	300	206
0799	2/2/1999	350	200
0799	3/3/1999	150	39
0799	4/6/1999	170	68.8
0799	5/4/1999	200	136

Station	Date	Turbidity	TSS
0799	6/1/1999	50	27
0808	1/19/1999	23	6
0808	2/17/1999	22	33
0808	3/16/1999	45	48
0808	4/20/1999	28	26.3
0808	5/20/1999	32	4
0808	6/15/1999	28.5	18
0809	1/12/1999	110	134
0809	2/9/1999	18	11
0809	3/9/1999	26	20
0809	5/11/1999	32	50
0809	6/8/1999	13	17

Legend

Station	Parish	Description of Station.
0016	Caldwell	Boeuf River near Ft. Necessity, LA
0025		Little River south of Rogers, LA
0069	Richland	Big Creek near Winnsboro, LA
0071	Caldwell	Bayou Lafourche Canal near Columbia, LA
0074		Bayou Bartholomew near Bastrop, LA
0076	Grant	Little River at Rochelle, LA
0089		Little River southwest of Jena, LA
0124	Richland	Bayou Lafourche Canal near Crew Lake, LA
0159	Concordia	Tensas River at Clayton, LA
0327	Richland	Big Creek East of Rayville, LA
0329	W. Carroll	Bayou Macon East of Oak Grove, LA
0330	Franklin	Bayou Macon Southwest of Winnsborro, LA
0771	Ouachita	Bayou Chauvin at control structure on Ouachita River Levee N of Monroe, LA
0773	Catahoula	Bayou Louis East of Harrisonburg, LA
0797	Madison	Joe's Bayou Southeast of Delhi, LA
0799	Concordia	Tensas River at Jonesville, LA
0808		Little River at Georgetown, LA
0809		Little River northeast of Ball, LA

July to December Data Set

Station	Date	Turbidity	TSS
0016	7/11/1978	16	30
0016	8/15/1978	25	40
0016	9/1/1978	23	48
0016	10/10/1978	23	28
0016	11/14/1978	9	16
0016	12/12/1978	190	232
0016	10/9/1979	60	152
0016	11/6/1979	9	92
0016	12/11/1979	51	78
0016	9/15/1980	26	72
0016	10/13/1980	32	40
0016	11/18/1980	47	92
0016	12/9/1980	63	88
0016	7/14/1981	55	68
0016	8/11/1981	15	58
0016	9/14/1981	32	68
0016	10/12/1981	34	58
0016	11/16/1981	35	40
0016	12/14/1981	24	36
0016	7/12/1982	89	84
0016	8/8/1982	82	134
0016	9/13/1982	170	270
0016	10/11/1982	110	140
0016	11/15/1982	18	44
0016	12/13/1982	57	48
0016	7/11/1983	170	72
0016	8/8/1983	78	68
0016	9/12/1983	66	68
0016	10/10/1983	85	62
0016	11/14/1983	42	34
0016	12/12/1983	230	112
0016	7/9/1984	240	148
0016	9/10/1984	56	48
0016	10/8/1984	190	148
0016	11/13/1984	104	38
0016	12/10/1984	185	42
0016	7/8/1985	62	40
0016	8/13/1985	74	48
0016	9/9/1985	102	80
0016	10/14/1985	25	132
0016	11/18/1985	111	76
0016	12/10/1985	144	36
0016	7/14/1986	79.5	52
0016	8/12/1986	60	108
0016	9/9/1986	64	64
0016	10/14/1986	128	120
0016	11/18/1986	50	30
0016	12/9/1986	56	28
0016	7/14/1987	64	28
0016	8/11/1987	45	48
0016	9/15/1987	17	22
0016	10/13/1987	28	52
0016	11/17/1987	222	332
0016	12/15/1987	55	68
0016	7/12/1988	29	34
0016	8/9/1988	40	62
0016	9/13/1988	35	70
0016	10/11/1988	54	72
0016	11/14/1988	137	136
0016	12/13/1988	80	36
0016	7/10/1989	55.5	24
0016	9/11/1989	40	90
0016	10/9/1989	17	28
0016	11/13/1989	93	96
0016	12/11/1989	74	102
0016	7/9/1990	108	178
0016	8/13/1990	36	98
0016	9/10/1990	34	55
0016	10/15/1990	27	88
0016	11/13/1990	180	284
0016	12/10/1990	130	194
0016	8/13/1991	112	156
0016	10/14/1991	50	74
0016	12/9/1991	88	42
0016	8/10/1992	64	66
0016	10/12/1992	27	39
0016	12/14/1992	39	62
0016	8/9/1993	88	160
0016	10/11/1993	28	36
0016	12/13/1993	130	52
0016	8/8/1994	55	75
0016	10/10/1994	70	132
0016	12/12/1994	185	248
0016	8/14/1995	15	40
0016	10/9/1995	22	44
0016	12/11/1995	12	16
0016	8/12/1996	56	64
0016	10/14/1996	34	30
0016	12/9/1996	70	40
0016	8/11/1997	100	100
0016	10/13/1997	55	66
0016	7/7/1999	180	258
0016	8/4/1999	180	266
0016	9/8/1999	36	29
0016	10/6/1999	27	41
0016	11/3/1999	40	38
0016	12/1/1999	32	34
0025	7/12/1994	48	246
0025	8/9/1994	30	43
0025	9/13/1994	45	44
0025	10/11/1994	29	29
0025	11/15/1994	28	29
0025	12/13/1994	17	23
0025	7/10/1995	25	82
0025	8/14/1995	15	53
0025	9/11/1995	28	48
0025	10/10/1995	11	22
0025	11/13/1995	20	14
0025	12/11/1995	12	14
0025	7/9/1996	25	40
0025	8/13/1996	27	48
0025	9/9/1996	28	32
0025	10/15/1996	20	12
0025	11/18/1996	30	42
0025	12/10/1996	15	10.5
0025	7/14/1997	65	106
0025	8/12/1997	55	57.9
0025	9/9/1997	35	37
0025	10/14/1997	37	34.9
0025	11/18/1997	19	10
0025	12/9/1997	21	14
0069	7/11/1978	17	18
0069	8/15/1978	17	50
0069	10/10/1978	28	38
0069	9/15/1980	24	34
0069	10/13/1980	19	18
0069	12/9/1980	50	82
0069	7/14/1981	53	66
0069	8/11/1981	18	44
0069	10/12/1981	9.5	14
0069	11/16/1981	22	32
0069	12/14/1981	16	34
0069	7/12/1982	47	60
0069	8/8/1982	92	140
0069	9/13/1982	84	140
0069	10/11/1982	28	72
0069	11/15/1982	9.7	22
0069	12/13/1982	65	64
0069	7/11/1983	105	96
0069	8/8/1983	300	144
0069	9/12/1983	32	54
0069	10/10/1983	46	40
0069	11/14/1983	52	56
0069	12/12/1983	270	150

July to December Data Set - continued

Station	Date	Turbidity	TSS
0069	9/10/1984	32	32
0069	10/8/1984	40	30
0069	11/13/1984	62	30
0069	12/10/1984	185	88
0069	7/8/1985	50	44
0069	8/13/1985	102	84
0069	9/9/1985	52	46
0069	10/14/1985	27	18
0069	11/18/1985	60	52
0069	12/10/1985	95	52
0069	7/14/1986	19	18
0069	8/12/1986	222	196
0069	9/9/1986	47	92
0069	10/14/1986	16	48
0069	11/18/1986	40	34
0069	12/9/1986	38	22
0069	7/14/1987	93	48
0069	8/11/1987	64	102
0069	9/15/1987	17	26
0069	10/13/1987	14	18
0069	11/17/1987	160	96
0069	12/15/1987	22	30
0069	8/9/1988	22	42
0069	9/13/1988	16	24
0069	10/11/1988	35	48
0069	11/14/1988	31	48
0069	12/13/1988	62	28
0069	7/10/1989	43.5	14
0069	8/14/1989	25	58
0069	9/11/1989	24	36
0069	10/9/1989	23	38
0069	11/13/1989	29	32
0069	12/11/1989	34	50
0069	7/9/1990	20	36
0069	8/13/1990	35	58
0069	9/10/1990	32	94
0069	10/15/1990	25	52
0069	11/13/1990	111	104
0069	12/10/1990	110	96
0069	7/16/1991	58	40
0069	9/10/1991	34	58
0069	11/19/1991	22	31
0069	7/14/1992	40	30
0069	9/15/1992	14	23
0069	11/17/1992	90	87
0069	7/13/1993	35	100
0069	9/14/1993	21	32
0069	11/16/1993	228	210
0069	7/12/1994	70	136
0069	9/13/1994	19	25
0069	11/15/1994	100	64
0069	7/11/1995	22	24
0069	9/12/1995	14	25
0069	11/14/1995	15	19
0069	7/9/1996	11	19
0069	9/10/1996	11	12
0069	11/19/1996	78	81
0069	7/15/1997	36	52
0069	9/9/1997	33	44
0069	11/18/1997	12	13
0069	7/7/1999	32	30
0069	8/4/1999	19	20
0069	9/8/1999	20	22
0069	10/6/1999	18	26
0069	11/3/1999	16	18
0069	12/1/1999	11	17
0071	7/11/1978	59	98
0071	8/15/1978	37	82
0071	10/10/1978	22	28
0071	11/14/1978	16	10
0071	9/15/1980	26	34
0071	10/13/1980	18	18
0071	12/9/1980	54	78
0071	7/14/1981	70	96
0071	8/11/1981	32	54
0071	9/14/1981	34	66
0071	10/12/1981	34	78
0071	11/16/1981	25	32
0071	12/14/1981	26	38
0071	7/12/1982	170	216
0071	8/8/1982	105	60
0071	9/13/1982	88	120
0071	10/11/1982	45	76
0071	11/15/1982	27	56
0071	12/13/1982	52	18
0071	7/11/1983	105	72
0071	8/8/1983	66	26
0071	9/12/1983	78	68
0071	10/10/1983	21	20
0071	11/14/1983	16	14
0071	12/12/1983	240	128
0071	7/9/1984	96	56
0071	9/10/1984	50	42
0071	10/8/1984	396	330
0071	11/13/1984	130	40
0071	12/10/1984	175	56
0071	7/8/1985	35	34
0071	8/13/1985	70	72
0071	9/9/1985	50	38
0071	10/14/1985	28	10
0071	11/18/1985	77	62
0071	12/10/1985	176	58
0071	7/14/1986	72	18
0071	8/12/1986	50	80
0071	9/9/1986	47	62
0071	10/14/1986	63	100
0071	11/18/1986	60	42
0071	12/9/1986	65	16
0071	7/14/1987	27	36
0071	8/11/1987	35	66
0071	9/15/1987	21	24
0071	10/13/1987	16	33
0071	11/17/1987	152	170
0071	12/15/1987	55	48
0071	7/12/1988	80	48
0071	8/9/1988	27	14
0071	9/13/1988	29	36
0071	11/14/1988	175	204
0071	12/13/1988	124	56
0071	7/10/1989	54	24
0071	9/11/1989	294	340
0071	10/9/1989	252	270
0071	11/13/1989	210	230
0071	12/11/1989	144	260
0071	7/9/1990	168	345
0071	9/10/1990	248	276
0071	10/15/1990	200	332
0071	11/13/1990	170	260
0071	12/10/1990	100	104
0071	8/13/1991	105	172
0071	10/14/1991	36	50
0071	12/9/1991	75	56
0071	8/10/1992	58	56
0071	10/12/1992	25	28
0071	12/14/1992	132	64
0071	8/9/1993	96	168
0071	10/11/1993	16	21
0071	12/13/1993	120	36
0071	8/8/1994	30	50
0071	10/10/1994	11	21
0071	12/12/1994	200	268
0071	8/14/1995	10	29
0071	10/9/1995	13	22
0071	12/11/1995	15	12

July to December Data Set - continued

Station	Date	Turbidity	TSS
0071	8/12/1996	32	28
0071	10/14/1996	27	16
0071	12/9/1996	72	28
0071	8/11/1997	80	80
0071	10/13/1997	27	44
0071	12/8/1997	240	198
0071	7/7/1999	39	27.3
0071	8/4/1999	19	15.3
0071	9/8/1999	20	20
0071	10/6/1999	22	29
0071	11/3/1999	16	17
0071	12/1/1999	19	22
0074	8/15/1995	6.2	36
0074	10/9/1995	10	26
0074	12/12/1995	6.5	5.5
0074	8/13/1996	25	42
0074	10/15/1996	22	5
0074	12/10/1996	31	13
0074	8/12/1997	45	33.9
0074	10/14/1997	20	23
0074	12/9/1997	60	22
0074	7/13/1999	50	35
0074	8/10/1999	38	41
0074	9/14/1999	23	26
0074	10/12/1999	18	27
0074	11/8/1999	14	13
0074	12/7/1999	16	16
0076	7/11/1994	21	13
0076	8/8/1994	26	20
0076	9/12/1994	35	21
0076	10/10/1994	18	37
0076	11/14/1994	18	26
0076	12/12/1994	16	21
0076	7/10/1995	10.1	35
0076	8/14/1995	20	9
0076	9/11/1995	20	11
0076	10/9/1995	18	22
0076	11/14/1995	7	4
0076	12/11/1995	5	K 4.0
0076	7/8/1996	20	194
0076	8/12/1996	18	38
0076	9/9/1996	13	10
0076	10/15/1996	18	36
0076	11/18/1996	11	9
0076	12/9/1996	21	19
0076	7/15/1997	19	10
0076	8/11/1997	28	11
0076	9/8/1997	23	20

Station	Date	Turbidity	TSS
0076	11/17/1997	15	K 4.0
0076	12/8/1997	24	13
0089	7/12/1994	24	26
0089	8/9/1994	25	35
0089	9/13/1994	30	29
0089	10/11/1994	30	32
0089	11/15/1994	20	36
0089	12/13/1994	17	15
0089	7/10/1995	25	39
0089	8/14/1995	22	43
0089	9/11/1995	17	18
0089	10/10/1995	12	13
0089	11/13/1995	19	20
0089	12/11/1995	15	7
0089	7/9/1996	20	44
0089	8/13/1996	20	24
0089	9/9/1996	18	18
0089	10/15/1996	22	24
0089	11/18/1996	30	44
0089	12/10/1996	15	9
0089	8/12/1997	60	32.9
0089	9/9/1997	27	20
0089	10/14/1997	38	28
0089	11/17/1997	27	18
0089	12/9/1997	22	19
0124	7/12/1982	58	68
0124	8/8/1982	41	76
0124	9/13/1982	36	60
0124	10/11/1982	97	164
0124	11/16/1982	21	21
0124	12/13/1982	130	200
0124	7/12/1983	100	78
0124	8/8/1983	95	84
0124	9/12/1983	41	46
0124	10/10/1983	28	24
0124	11/14/1983	21	28
0124	12/13/1983	320	230
0124	7/9/1984	170	116
0124	9/10/1984	40	42
0124	10/8/1984	132	128
0124	11/13/1984	140	36
0124	12/10/1984	136	34
0124	7/8/1985	44	44
0124	8/13/1985	95	98
0124	9/9/1985	59	12
0124	10/14/1985	55	36
0124	11/18/1985	71	44
0124	12/10/1985	207	56

Station	Date	Turbidity	TSS
0124	7/14/1986	26	12
0124	8/12/1986	99	120
0124	9/9/1986	48	64
0124	10/14/1986	58	104
0124	11/16/1986	22	44
0124	11/18/1986	40	42
0124	12/9/1986	75	12
0124	12/14/1986	16	32
0124	7/14/1987	19	27
0124	8/11/1987	34	74
0124	9/15/1987	23	46
0124	10/13/1987	18	36
0124	12/15/1987	45	84
0124	7/12/1988	29	32
0124	8/9/1988	26	24
0124	9/13/1988	34	76
0124	10/11/1988	30	40
0124	11/14/1988	74	80
0124	12/13/1988	130	56
0124	7/10/1989	60	56
0124	8/14/1989	49.5	44
0124	9/11/1989	26	50
0124	10/9/1989	22	40
0124	11/13/1989	155	120
0124	12/11/1989	122.5	106
0124	7/9/1990	24	36
0124	8/13/1990	31	72
0124	9/10/1990	93	166
0124	10/15/1990	23	43
0124	11/13/1990	102	136
0124	12/10/1990	100	56
0124	7/16/1991	72	68
0124	9/10/1991	30	62
0124	11/19/1991	25	16
0124	7/14/1992	40	24
0124	9/15/1992	27	37
0124	11/17/1992	32	35
0124	7/13/1993	70	104
0124	9/14/1993	22	31
0124	11/16/1993	234	286
0124	7/12/1994	28	50
0124	9/13/1994	23	26
0124	11/15/1994	60	39
0124	7/11/1995	35	42
0124	9/12/1995	23	70
0124	11/14/1995	15	22
0124	7/9/1996	30	64
0124	9/10/1996	17	31

July to December Data Set - continued

Station	Date	Turbidity	TSS
0124	11/19/1996	50	39
0124	7/15/1997	50	59
0124	9/9/1997	45	60
0124	11/18/1997	90	34
0159	11/16/1988	29	41
0159	12/12/1988	119	66
0159	7/11/1989	132	62
0159	8/15/1989	23	26
0159	10/10/1989	8.2	10
0159	11/14/1989	19	46
0159	12/12/1989	8.5	32
0159	7/9/1990	24	29
0159	8/14/1990	9.5	20
0159	11/14/1990	17	30
0159	12/11/1990	22	26
0159	8/12/1991	16	24
0159	12/10/1991	133	82
0159	8/10/1992	22	28
0159	10/12/1992	24	19
0159	12/14/1992	136	91
0159	8/10/1993	21	31
0159	10/12/1993	8.8	11
0159	12/14/1993	70	48
0159	8/9/1994	15	13
0159	10/10/1994	19	34
0159	12/13/1994	63	68
0159	10/10/1995	16	23
0159	12/12/1995	9	10
0159	8/13/1996	22	27
0159	12/10/1996	165	52
0159	10/13/1997	12	18.9
0159	12/9/1997	250	116
0159	7/13/1998	15	19
0159	8/10/1998	8	10
0159	9/14/1998	13	16
0159	10/12/1998	12	18
0159	11/16/1998	55	29.5
0159	12/14/1998	260	70
0159	7/14/1999	70	38.5
0159	8/11/1999	10	13.3
0159	9/15/1999	10.8	10
0159	10/13/1999	8.1	8
0159	11/9/1999	7.9	18
0159	12/8/1999	13	11
0159	7/11/2000	9.2	10
0159	10/31/2000	11	7.3
0159	12/5/2000	50	31
0159	8/7/2001	13	26
0159	9/4/2001	50	43
0159	10/2/2001	11	13
0159	12/4/2001	215	186
0327	7/16/1991	26	28
0327	7/16/1991	32	48
0327	9/10/1991	37	32
0327	9/10/1991	22	36
0327	11/19/1991	13	20
0327	11/19/1991	16	16
0327	7/14/1992	35	26
0327	7/14/1992	18	44
0327	9/15/1992	17	17
0327	9/15/1992	23	11
0327	11/17/1992	64	58
0327	11/17/1992	25	11
0327	7/13/1993	250	284
0327	7/13/1993	21	32
0327	11/16/1993	195	137
0327	11/16/1993	102	37
0327	7/12/1994	108	116
0327	7/12/1994	120	58
0327	9/13/1994	12	16
0327	9/13/1994	13	13
0327	11/15/1994	62	116
0327	11/15/1994	11	13
0327	7/11/1995	15	43
0327	7/11/1995	45	44
0327	9/12/1995	15	24
0327	9/12/1995	13	13
0327	7/9/1996	14	24
0327	7/9/1996	11	20
0327	9/10/1996	10	24
0327	9/10/1996	15	36
0327	11/19/1996	155	128
0327	7/15/1997	85	80
0327	7/15/1997	14	9.5
0327	9/9/1997	12	8
0327	9/9/1997	21	29
0327	11/18/1997	50	24
0329	8/13/1991	66	152
0329	10/15/1991	60	148
0329	12/10/1991	252	360
0329	8/11/1992	195	290
0329	10/13/1992	24	62
0329	12/15/1992	82.5	166
0329	8/10/1993	37	94
0329	10/12/1993	11	23
0329	12/14/1993	40	62
0329	8/9/1994	40	119
0329	12/13/1994	125	80
0329	8/15/1995	20	92
0329	10/9/1995	21	54
0329	12/12/1995	12	11.3
0329	8/13/1996	57	106
0329	10/15/1996	22	34.7
0329	12/10/1996	50	98
0329	8/12/1997	30	79
0329	10/14/1997	22	40
0329	12/9/1997	150	124
0330	8/12/1991	66	102
0330	10/15/1991	30	58
0330	12/10/1991	126	64
0330	8/11/1992	60	60
0330	10/13/1992	18	35
0330	12/15/1992	124	120
0330	8/10/1993	105	92
0330	10/12/1993	33	53
0330	12/14/1993	57	36
0330	8/9/1994	35	73
0330	10/11/1994	90	160
0330	12/13/1994	150	216
0330	8/15/1995	15	70
0330	10/10/1995	29	57
0330	8/13/1996	35	38
0330	10/15/1996	30	56
0330	12/10/1996	125	94
0330	8/12/1997	150	204
0330	10/14/1997	45	69.9
0330	12/9/1997	240	208
0771	7/20/1999	55	52
0771	8/17/1999	160	224
0771	9/21/1999	65	164
0771	10/19/1999	115	144
0771	11/16/1999	60	92
0771	12/14/1999	100	58
0773	9/15/1999	20.4	21
0773	11/9/1999	21	15.5
0773	12/8/1999	25	26.4
0797	7/6/1999	120	48
0797	8/3/1999	45	28
0799	7/6/1999	120	49
0799	8/3/1999	18	10
0799	10/5/1999	9.8	15.5
0799	11/30/1999	16	13
0800	10/5/1999	50	31.4
0808	7/20/1999	40	33

July to December Data Set - continued

Station	Date	Turbidity	TSS
0808	8/17/1999	33	16
0808	9/21/1999	25	25
0808	10/19/1999	20	21
0808	11/16/1999	12	12.4

Station	Date	Turbidity	TSS
0808	12/14/1999	23	14.5
0809	7/13/1999	33	35
0809	8/10/1999	36	52
0809	9/14/1999	25	42

Station	Date	Turbidity	TSS
0809	10/12/1999	25	33
0809	11/8/1999	6.5	10.3
0809	12/7/1999	23	28

Legend

Station	Parish	Description of Station.
0016	Caldwell	Boeuf River near Ft. Necessity, LA
0025		Little River south of Rogers, LA
0069	Richland	Big Creek near Winnsboro, LA
0071	Caldwell	Bayou Lafourche Canal near Columbia, LA
0074		Bayou Bartholomew near Bastrop, LA
0076	Grant	Little River at Rochelle, LA
0089		Little River southwest of Jena, LA
0124	Richland	Bayou Lafourche Canal near Crew Lake, LA
0159	Concordia	Tensas River at Clayton, LA
0327	Richland	Big Creek East of Rayville, LA
0329	W. Carroll	Bayou Macon East of Oak Grove, LA
0330	Franklin	Bayou Macon Southwest of Winnsborro, LA
0771	Ouachita	Bayou Chauvin at control structure on Ouachita River Levee N of Monroe, LA
0773	Catahoula	Bayou Louis East of Harrisonburg, LA
0797	Madison	Joe's Bayou Southeast of Delhi, LA
0799	Concordia	Tensas River at Jonesville, LA
0800	Tensas	Lake St. Joseph in Newellton, LA
0808		Little River at Georgetown, LA
0809		Little River northeast of Ball, LA

APPENDIX C: Ambient Monitoring Data, Excluded

Station	Date	Turbidity	TSS	Flag
0069	1/12/1981	5	4	xs
0069	1/14/1985	5.1	9	s
0069	1/6/1999	110	510	x
0016	1/6/1999	550	596	xs
0800	1/5/1999	130	3.9	x
0016	2/13/1984	576	360	s
0071	2/11/1985	594	460	xs
0069	2/11/1985	592	350	s
0797	2/2/1999	700	437	s
0800	2/2/1999	150	3	x
0327	3/10/1992	510	860	xs
0800	3/2/1999	60	3.3	x
0071	4/9/1984	680	340	s
0124	4/9/1984	592	290	s
0016	4/9/1984	494	220	s
0069	4/8/1985	512	100	s
0071	4/12/1988	740	72	s
0329	4/15/1991	570	670	xs
0330	4/16/1991	481	600	xs
0159	4/15/1991	468	610	x
0329	4/12/1994	700	790	xs
0159	4/15/1997	90	6	x
0773	4/14/1999	60	6	x
0800	4/6/1999	85	3.2	x
0071	5/9/1978	475	932	xs
0016	5/9/1978	445	808	x
0016	5/12/1981	83	552	x
0071	5/14/1984	560	96	s
0124	5/14/1984	780	200	s
0016	5/14/1984	600	128	s
0124	5/14/1990	315	590	x
0069	5/14/1990	374	450	x
0327	5/12/1998	8.3	5	x
0800	5/4/1999	40	2.7	x
0069	6/9/1981	200	544	x
0016	6/9/1981	340	778	x
0071	6/11/1984	600	220	s
0016	6/11/1984	525	210	s
0069	6/9/1987	1.5	80	s
0330	6/10/1997	469	520	x
0800	6/1/1999	36	1.6	x
0069	7/9/1984	558	320	s
0069	7/12/1988	20	2	x
0773	7/14/1999	7.6	8.5	s
0800	7/6/1999	32	1.3	x
0159	7/10/2001	7.5	10.7	s
0071	8/14/1989	228	492	x
0016	8/14/1989	198	456	x
0071	8/13/1990	272	476	x
0159	8/12/1997	7.8	6	xs
0773	8/11/1999	7.2	11	s
0025	6/10/1996	6.5	767	X
0800	8/3/1999	30	1.3	x
0159	8/15/2000	6.2	9.3	s
0069	9/14/1981	5.2	20	s
0159	9/12/1989	7.4	12	s
0159	9/11/1990	6.2	9	s
0327	9/14/1993	6.9	14	s
0327	9/14/1993	7.6	12	s
0800	9/7/1999	29	1.3	x
0159	9/12/2000	5.2	7	s
0159	10/16/1990	7.5	11	s
0159	10/14/1991	4.3	7	s
0329	10/11/1994	210	678	x
0159	10/14/1996	6	12	s
0773	10/13/1999	10	5.3	x
0159	10/3/2000	4.5	9	s
0124	11/17/1987	480	716	xs
0327	11/14/1995	4.5	11	s
0327	11/14/1995	2	4	xs
0327	11/19/1996	15	5	x
0327	11/18/1997	7.8	4	xs
0800	11/30/1999	45	1.3	x
0800	11/2/1999	140	1.3	x
0799	11/2/1999	8.6	5	x
0159	11/6/2001	230	450	x
0330	12/12/1995	4.5	9.5	s

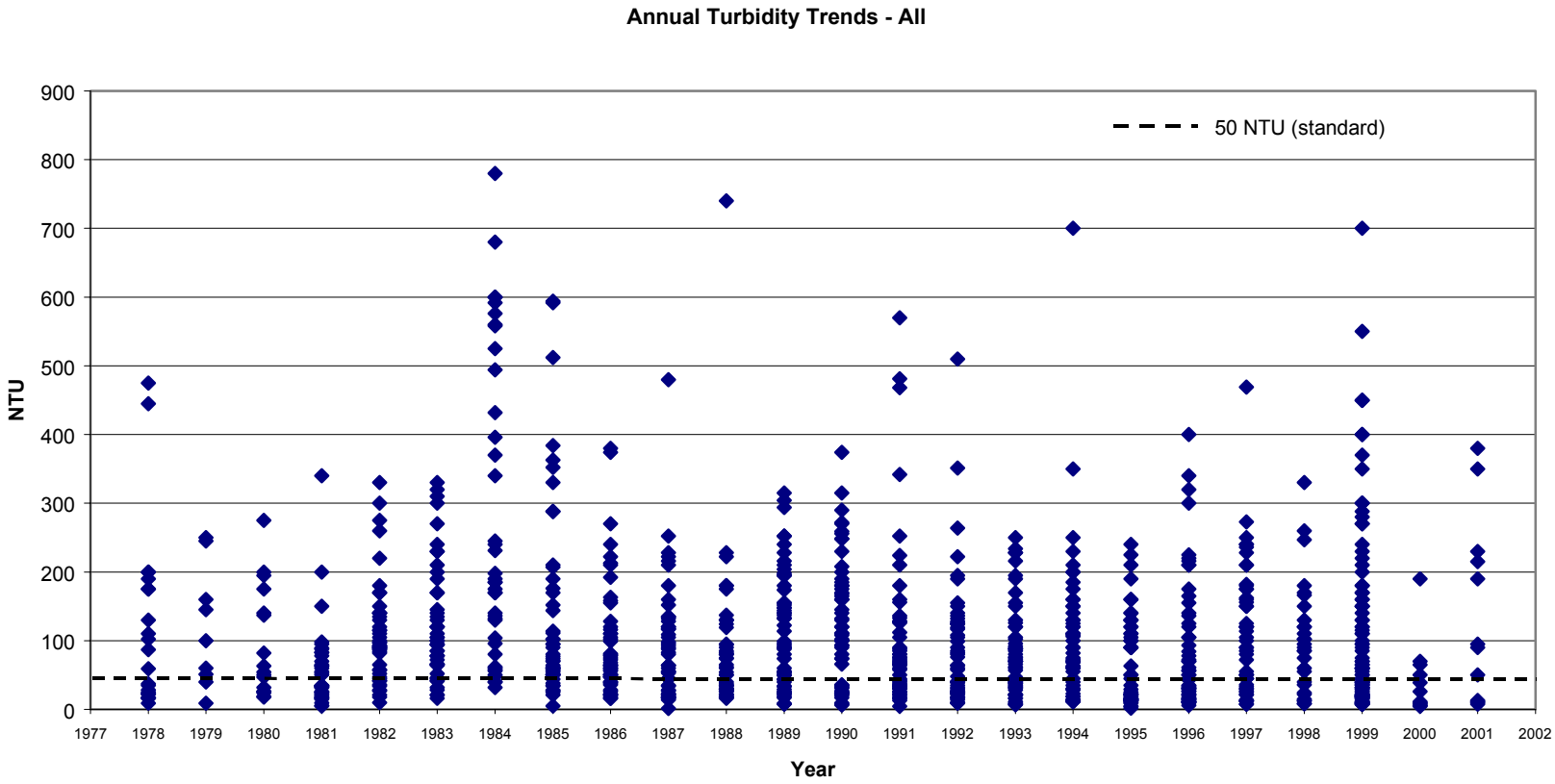
Legend

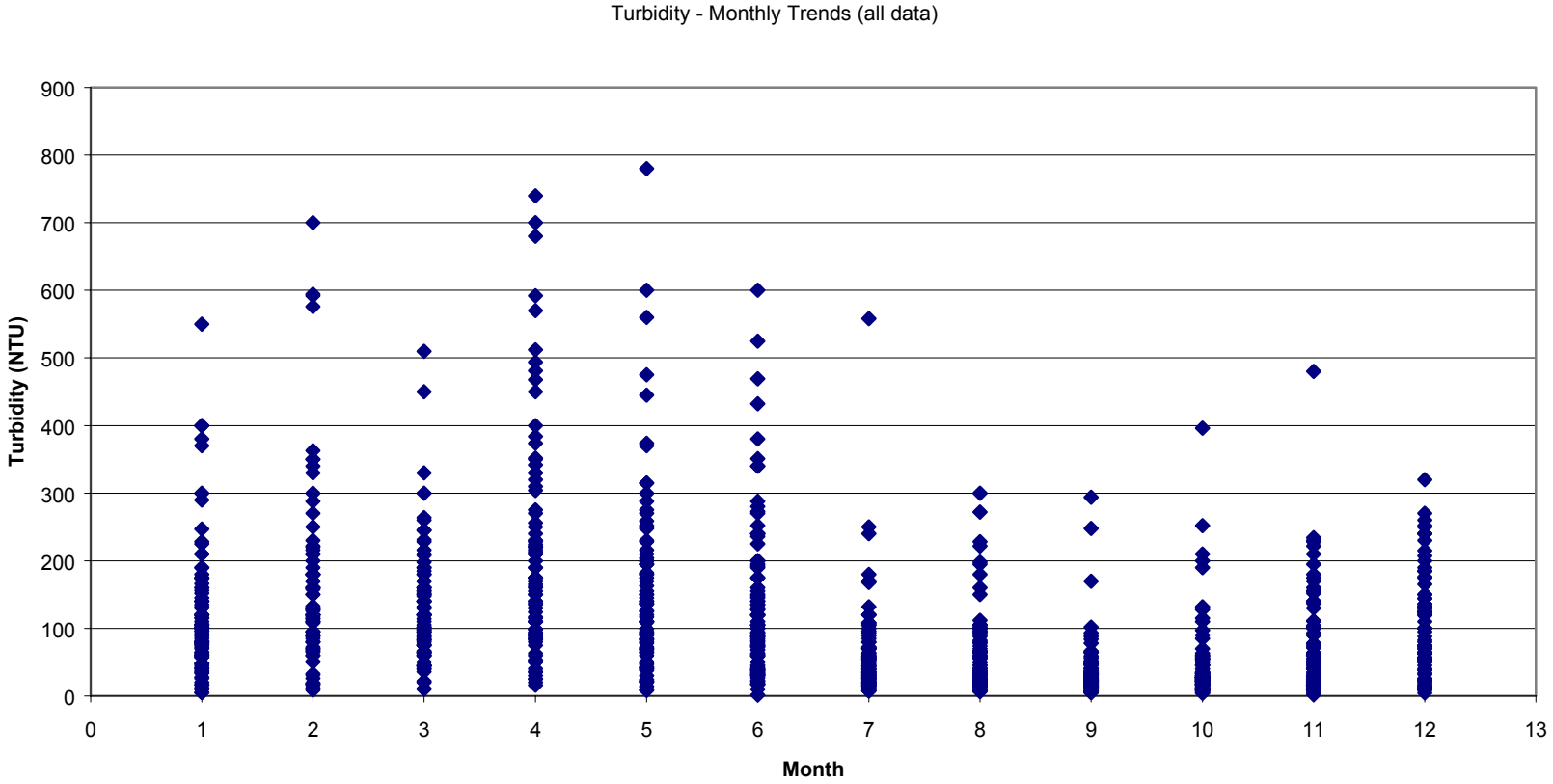
flag: x=	excluded by TSS
flag: s=	excluded by Turbidity
flag: xs=	excluded by both

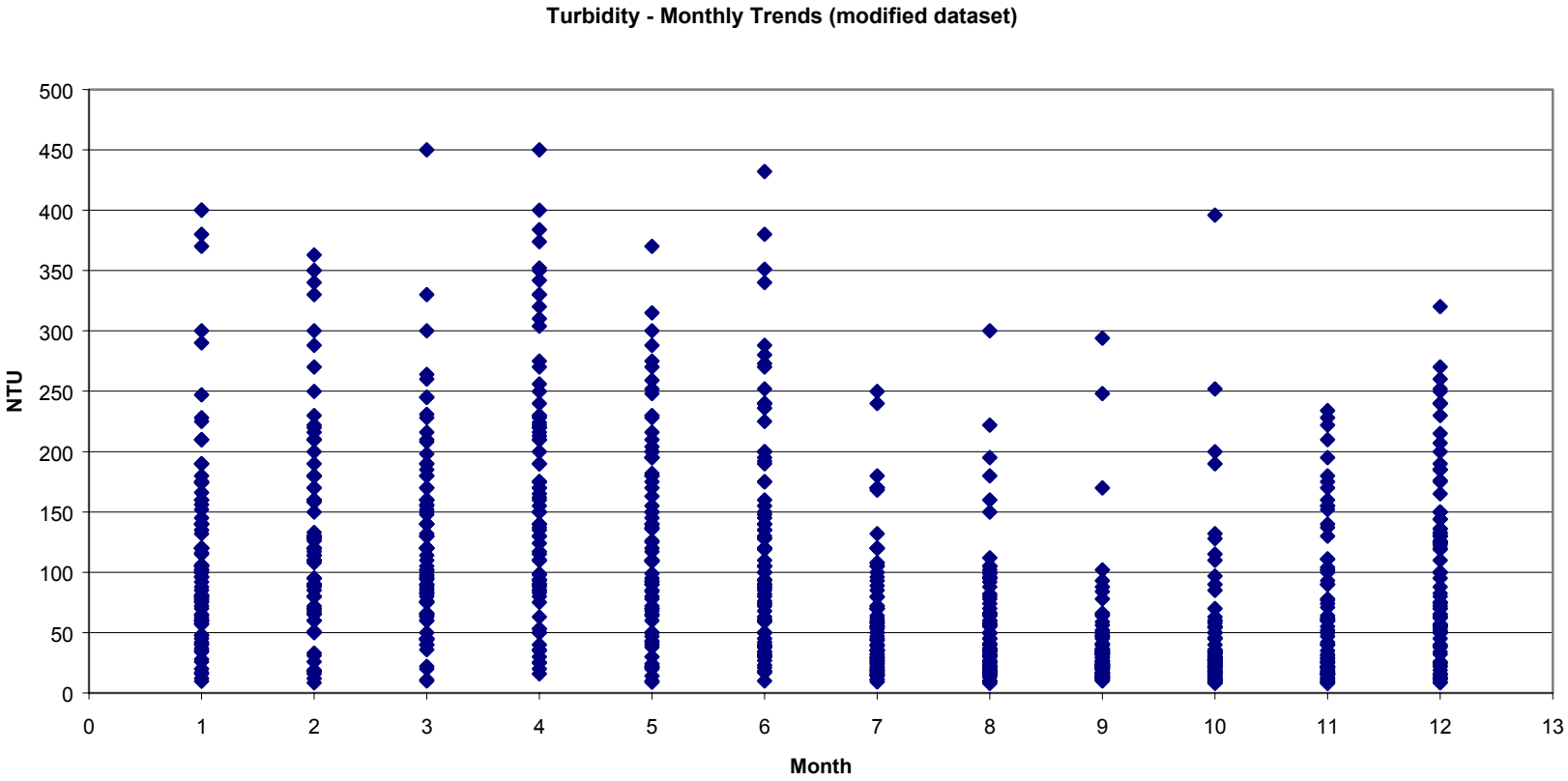
Legend

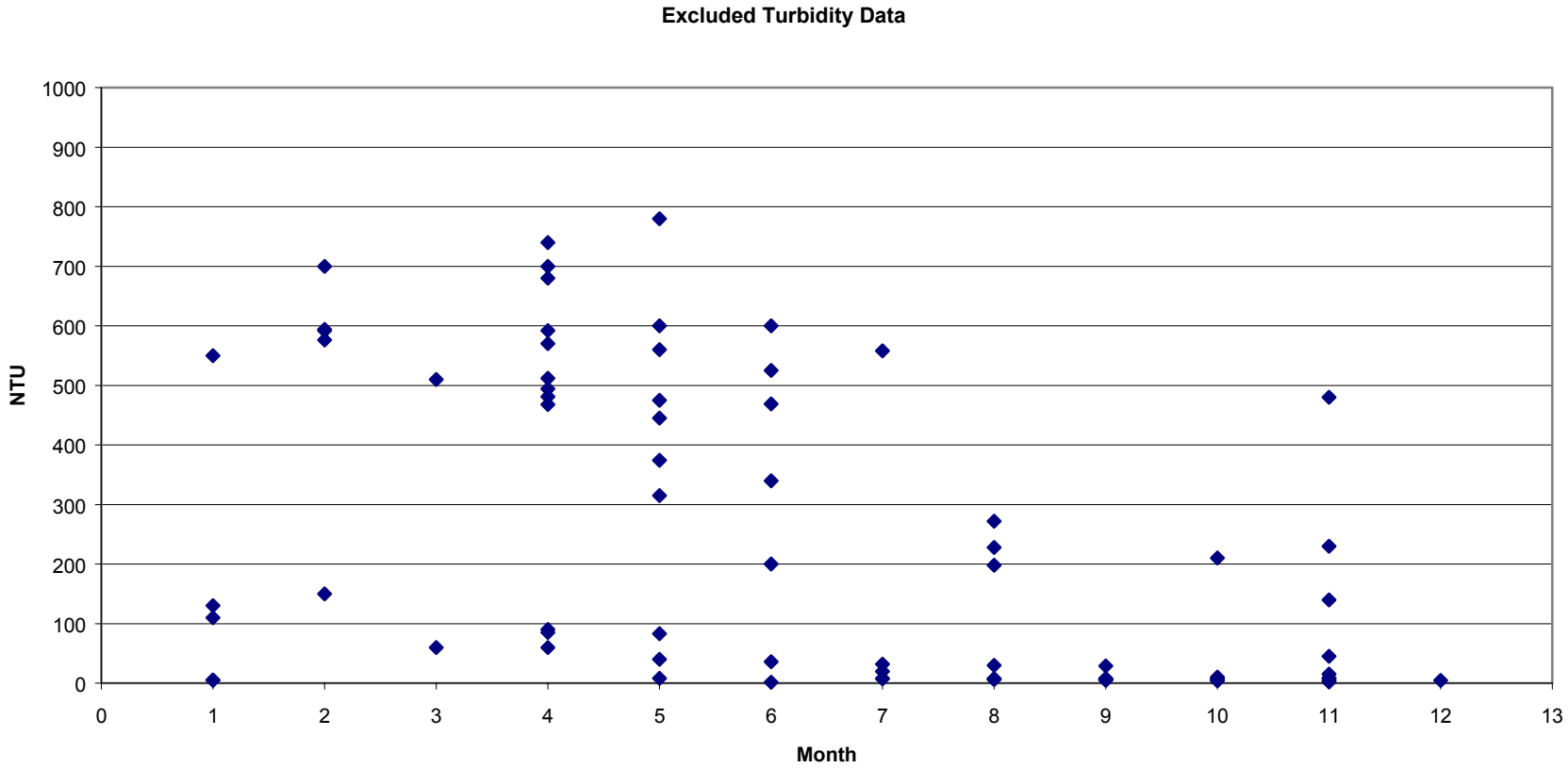
Station	Parish	Description of Station.
0016	Caldwell	Boeuf River near Ft. Necessity, LA
0069	Richland	Big Creek near Winnsboro, LA
0071	Caldwell	Bayou Lafourche Canal near Columbia, LA
0124	Richland	Bayou Lafourche Canal near Crew Lake, LA
0159	Concordia	Tensas River at Clayton, LA
0327	Richland	Big Creek East of Rayville, LA
0329	W. Carroll	Bayou Macon East of Oak Grove, LA
0330	Franklin	Bayou Macon Southwest of Winnsborro, LA
0773	Catahoula	Bayou Louis East of Harrisonburg, LA
0797	Madison	Joe's Bayou Southeast of Delhi, LA
0799	Concordia	Tensas River at Jonesville, LA
0800	Tensas	Lake St. Joseph in Newellton, LA

APPENDIX D: Turbidity Graphs

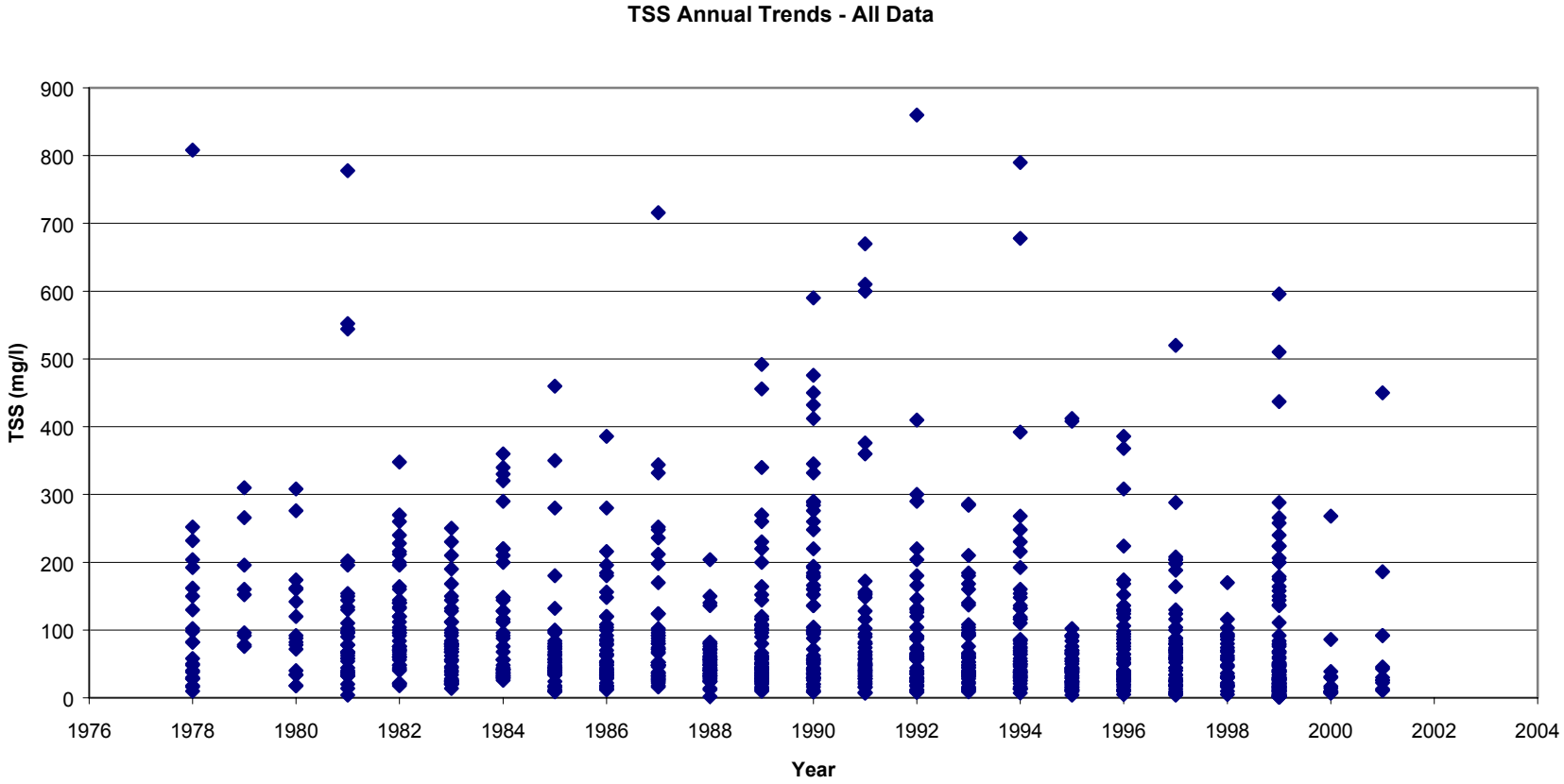

Annual Turbidity Trends - All
50 NTU (standard)
NTU
900
800
700
600
500
400
300
200
100
0
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
Year

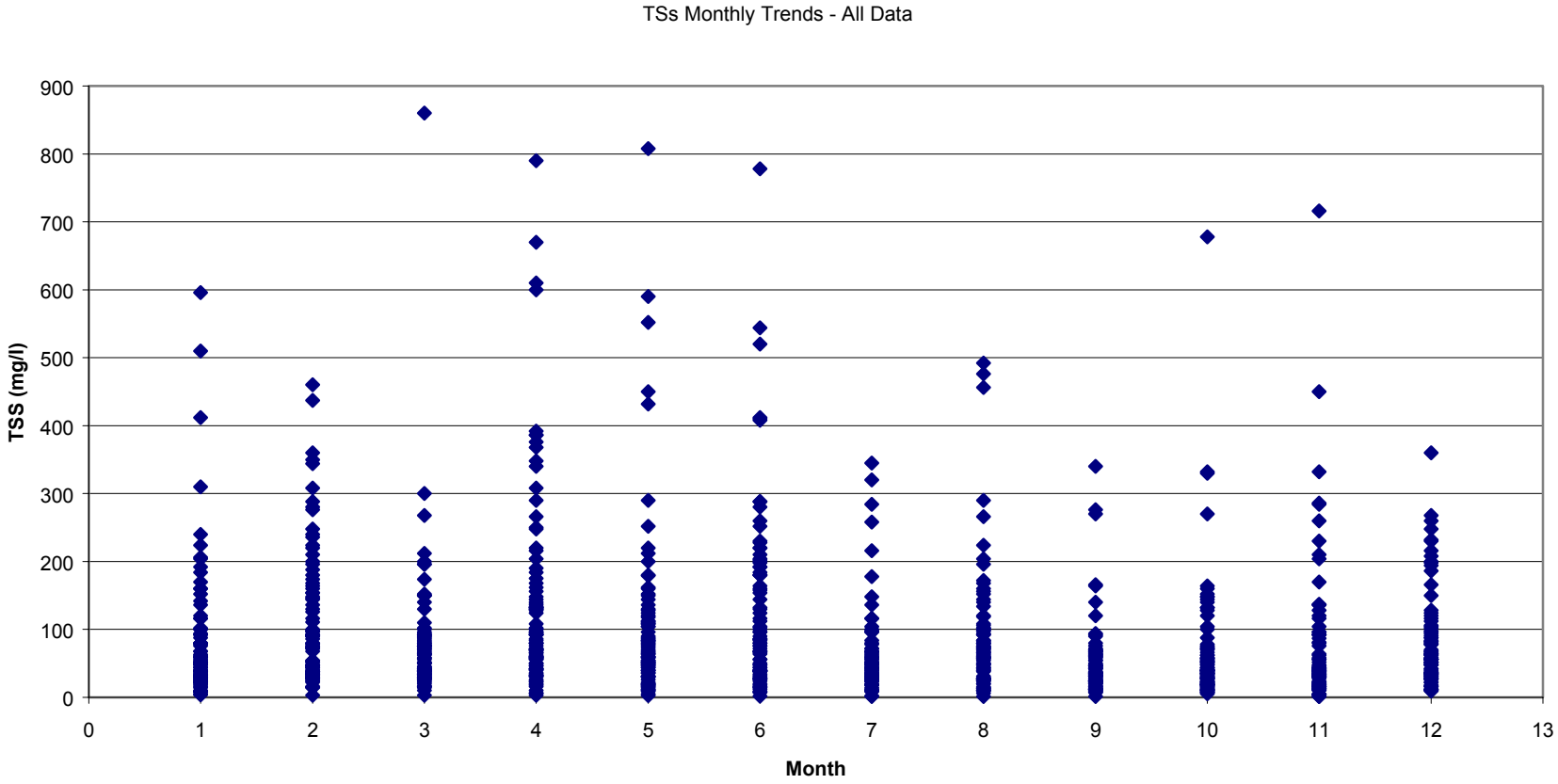

Turbidity - Monthly Trends (all data)
Turbidity (NTU)
900
800
700
600
500
400
300
200
100
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Month

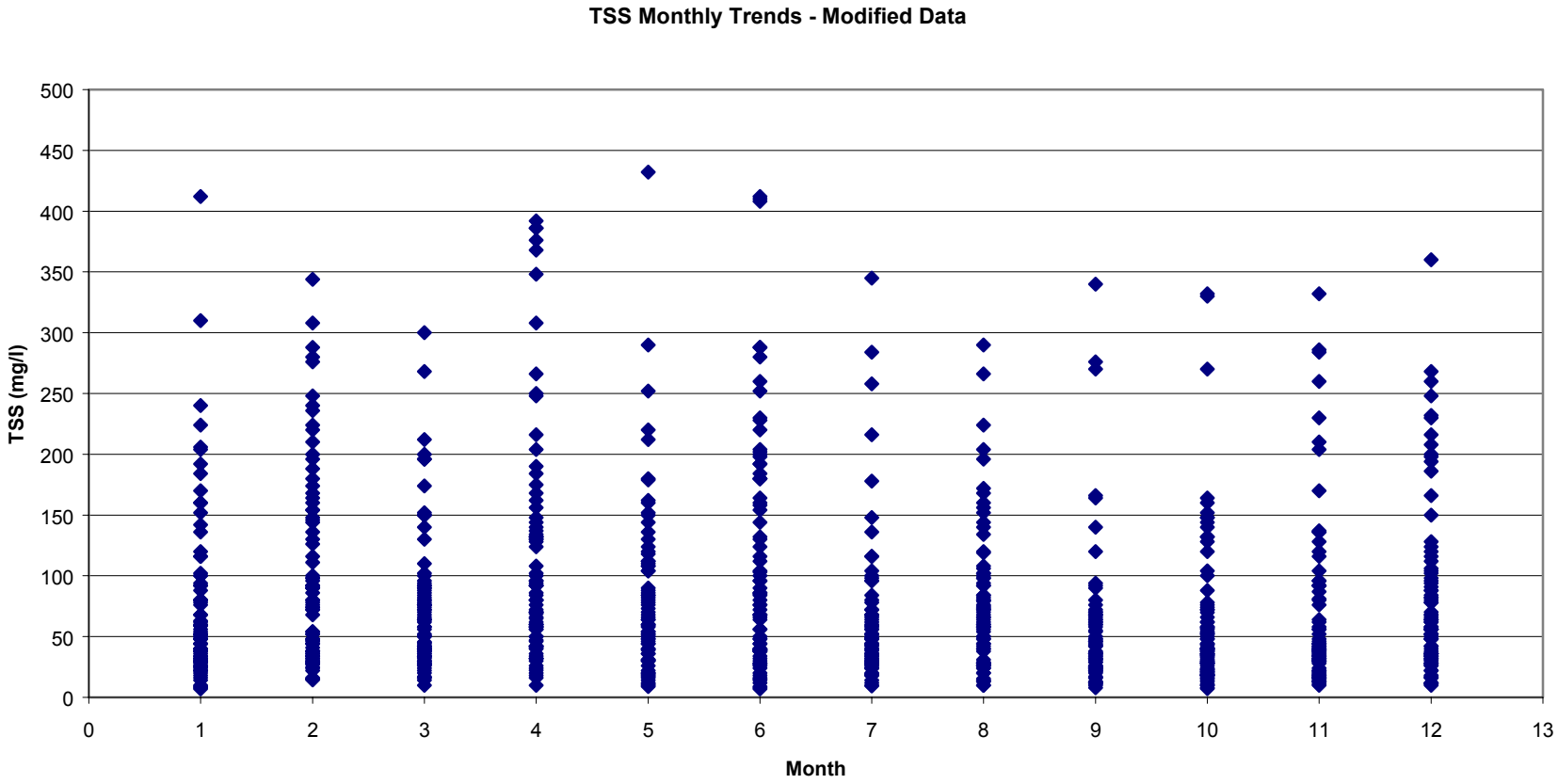

Turbidity - Monthly Trends (modified dataset)
NTU
500
450
400
350
300
250
200
150
100
50
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Month

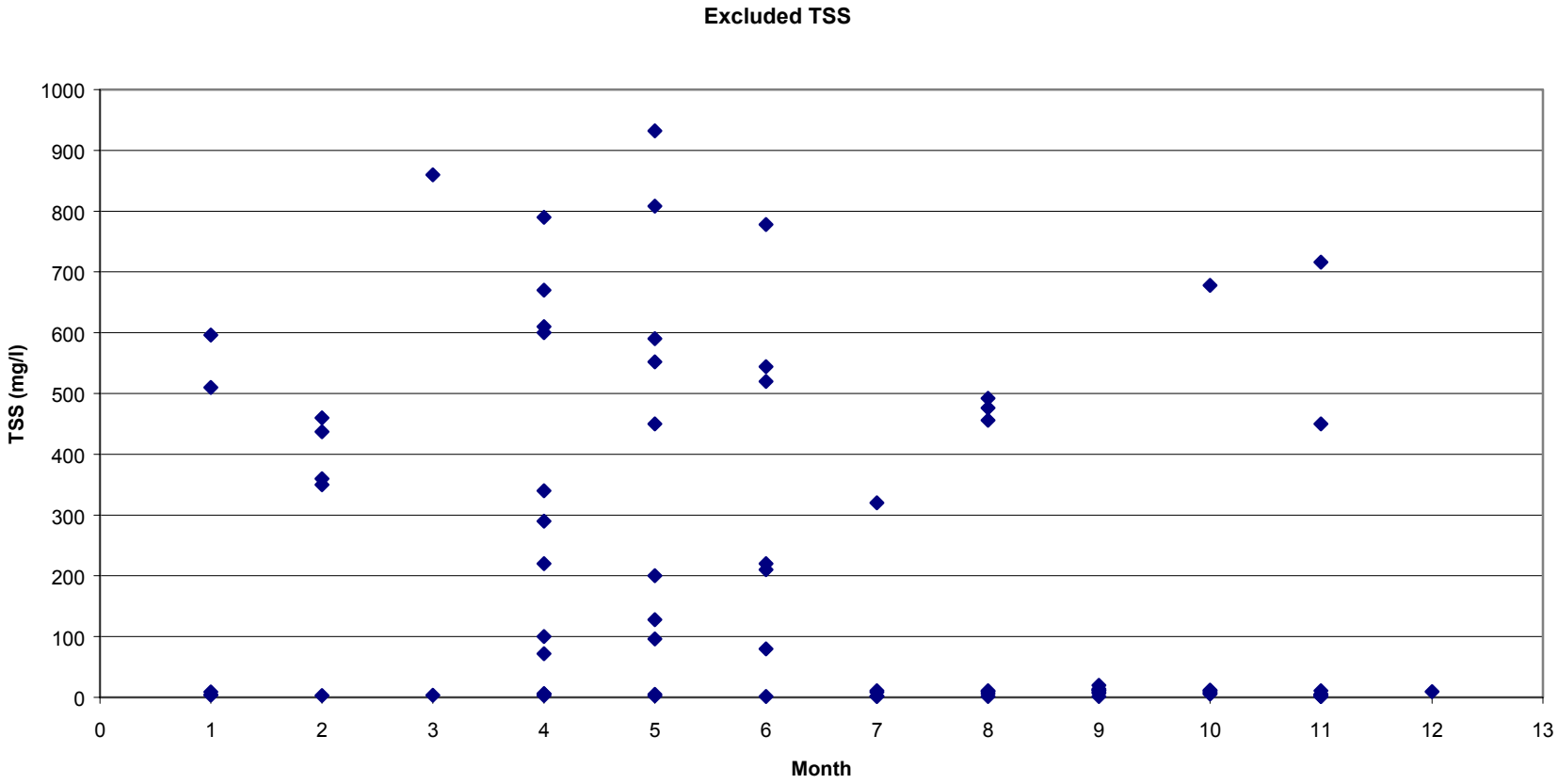

Excluded Turbidity Data
NTU
1000
900
800
700
600
500
400
300
200
100
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Month

APPENDIX E: TSS Graphs

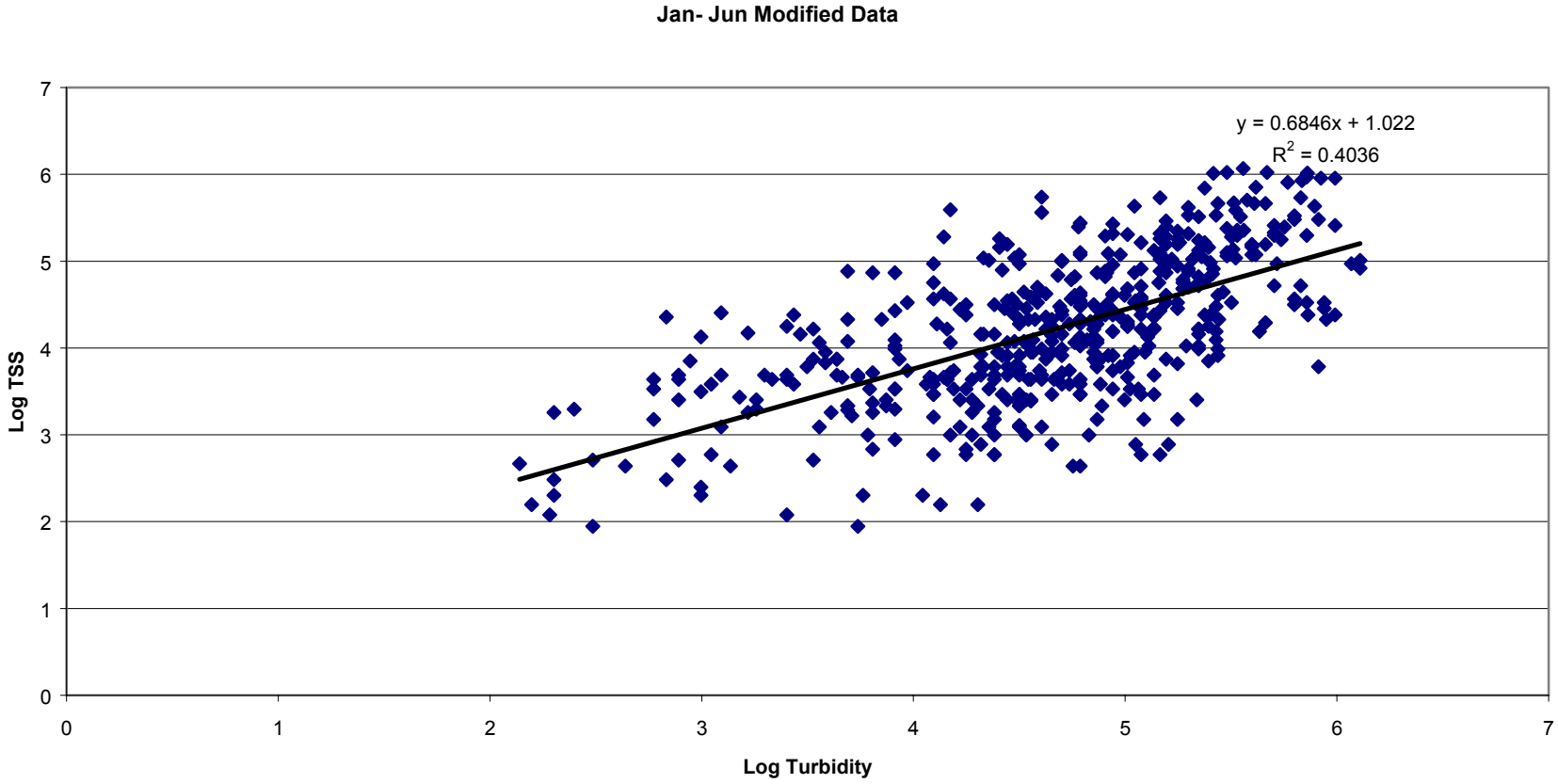


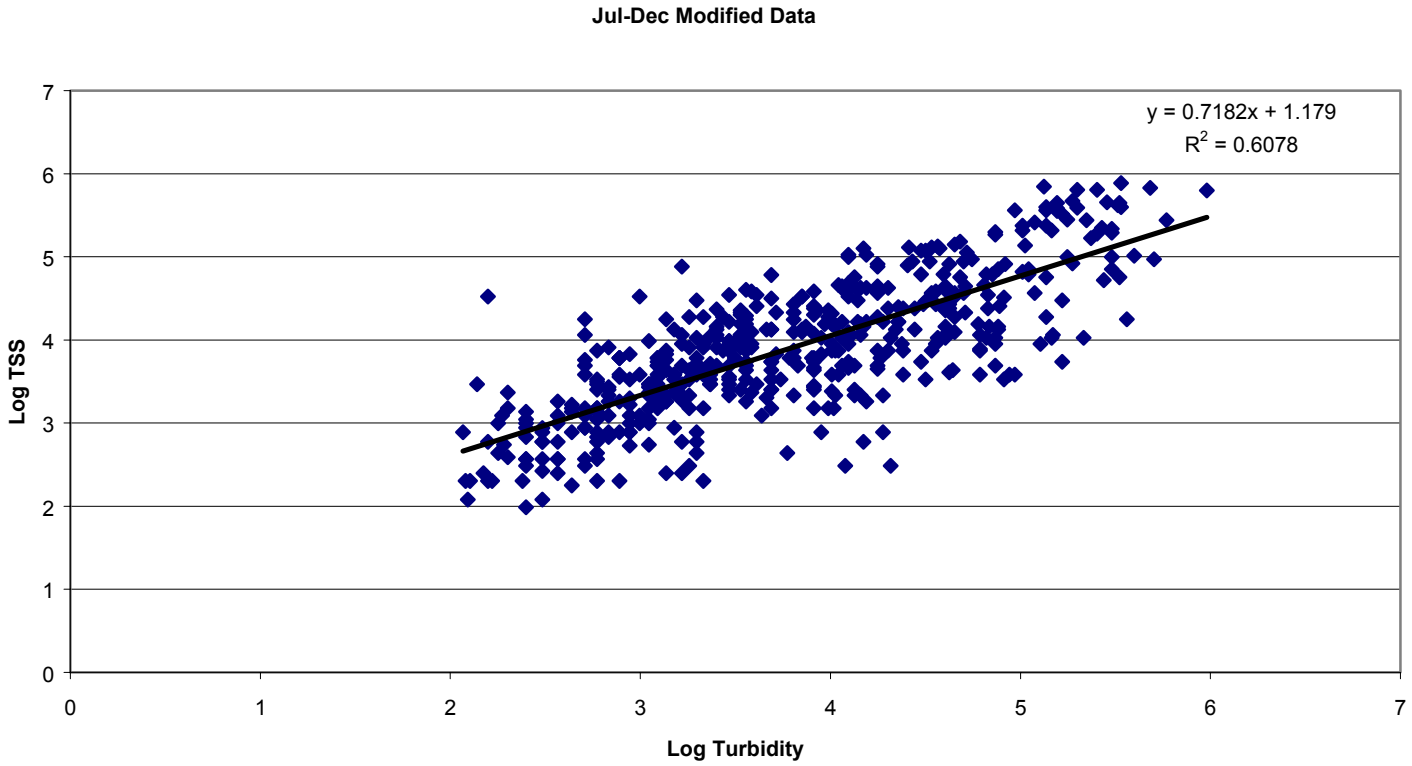

TSs Monthly Trends - All Data
TSS (mg/l)
900
800
700
600
500
400
300
200
100
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Month


TSS Monthly Trends - Modified Data
TSS (mg/l)
500
450
400
350
300
250
200
150
100
50
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Month


Excluded TSS
TSS (mg/l)
1000
900
800
700
600
500
400
300
200
100
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Month

APPENDIX F: Regression Graphs




Jul-Dec Modified Data
y = 0.7182x + 1.179
R2 = 0.6078
Log TSS
Log Turbidity
0
1
2
3
4
5
6
7

APPENDIX G: Flow Calculation Tables

Area Weighting of Subsegments in State Divisions for Precipitation

	Fraction of impaired subsegment in each county											% in the State Divisions		
Subseg	Morehouse	West Carroll	East Carroll	Ouachita	Richland	Madison	Franklin	Caldwell	Tensas	Catahoula	Concordia	NE	NC	Central
080102				1.0000								0.0%	100.0%	0.0%
080202										1.0000		0.0%	0.0%	100.0%
080901	0.2767	0.1761			0.2893		0.1069	0.1195		0.0314		84.9%	11.9%	3.1%
080903		0.3241			0.5833		0.0926					100.0%	0.0%	0.0%
080904	0.3972	0.0000		0.3404	0.0993			0.1631				49.6%	50.4%	0.0%
080910					1.0000							100.0%	0.0%	0.0%
081001		0.2921	0.2584		0.0674	0.0449	0.3258			0.0112		98.9%	0.0%	1.1%
081002			0.5652			0.4348						100.0%	0.0%	0.0%
081201			0.1520			0.4324	0.0574		0.3209	0.0338	0.0034	96.3%	0.0%	3.7%
081202			0.0000			0.0741			0.9259			100.0%	0.0%	0.0%

Flow attributed to Precipitation on the Subsegment

	State Division Precipitation Jan-Jun & Jul-Dec							Flow	Flow
Subseg	NE j_j	NE j_d	NC j_j	NC j_d	C j_j	C j_d	area-mi2	MGD j_j	MGD j_d
080102	18.33	3.63	16.89	3.59	17.47	4.51	36.36	59.3	12.6
080202	18.33	3.63	16.89	3.59	17.47	4.51	36.16	61.0	15.7
080901	18.33	3.63	16.89	3.59	17.47	4.51	634.56	1110.7	223.8
080903	18.33	3.63	16.89	3.59	17.47	4.51	431.65	763.9	151.3
080904	18.33	3.63	16.89	3.59	17.47	4.51	565.63	961.4	197.1
080910	18.33	3.63	16.89	3.59	17.47	4.51	2.16	3.8	0.8
081001	18.33	3.63	16.89	3.59	17.47	4.51	354.22	626.5	124.5
081002	18.33	3.63	16.89	3.59	17.47	4.51	95.53	169.1	33.5
081201	18.33	3.63	16.89	3.59	17.47	4.51	1202.76	2124.7	425.3
081202	18.33	3.63	16.89	3.59	17.47	4.51	110.76	196.0	38.8

APPENDIX H: Reasonable Reduction Calculation Tables

Organized in order by a Parish, then by subsegment with in the Parish

Boeuf River - Arkansas State Line to Ouachita River 080901

Coverage Type	Area km2	Percent of Watershed	Acres in West Carroll	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	50% buffer	85% buffer
Deciduous Forest	29.38	1.79%	2265	83	0.004	1	77	0.002	1	752.0474829	348.841302
Evergreen Forest	10.45	0.64%	806	83	0.004	1	77	0.002	1	267.5139345	124.087789
Forested Wetlands	259.33	15.80%	19993	NC	NC	NC	NC	NC	NC		
Mixed Forest	69.76	4.25%	5378	83	0.004	1	77	0.002	1	1785.568553	828.245654
Non Forested Wetlands	1.71	0.10%	132	NC	NC	NC	NC	NC	NC		
Other	1.02	0.06%	79	NC	NC	NC	NC	NC	NC		
Pasture	81.07	4.94%	6250	86.6	0.04	0.6	80.75	0.01	0.52	12989.35722	2624.24514
Row Crops	986.90	60.12%	76084	88.6	0.457571	0.6	85.75	0.2431429	0.52	1850709.224	824884.811
Small Grains	158.38	9.65%	12210	85.6	0.38	0.6	83.6	0.1871429	0.52	238303.7565	99335.6535
Urban	3.13	0.19%	241	NC	NC	NC	NC	NC	NC		
Water	41.49	2.53%	3199	NC	NC	NC	NC	NC	NC		
TOTAL	1641.60	100%								2104807.468	928145.884
										1052403.734	139221.883

Parish reasonable reduction 87%

Big Creek - Headwaters to Boeuf River (including Big 080903

Coverage Type	Area km2	Percent of Watershed	Acres in West Carroll	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	50% buffer	85% buffer
Deciduous Forest	15.97	1.43%	1539	83	0.004	1	77	0.002	1	510.8173165	236.945382
Evergreen Forest	8.62	0.77%	831	83	0.004	1	77	0.002	1	275.8240741	127.942492
Forested Wetlands	62.15	5.56%	5990	NC	NC	NC	NC	NC	NC		
Mixed Forest	123.11	11.01%	11864	83	0.004	1	77	0.002	1	3938.735529	1827.00383
Non Forested Wetlands	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Other	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Pasture	13.80	1.23%	1330	86.6	0.04	0.6	80.75	0.01	0.52	2764.67104	558.547618
Row Crops	784.55	70.15%	75606	88.6	0.457571	0.6	85.75	0.2431429	0.52	1839070.087	819697.098
Small Grains	91.06	8.14%	8775	85.6	0.38	0.6	83.6	0.1871429	0.52	171256.5346	71387.3757
Urban	10.06	0.90%	969	NC	NC	NC	NC	NC	NC		
Water	9.07	0.81%	874	NC	NC	NC	NC	NC	NC		
TOTAL	1118.40	100%								2017816.67	893834.913
										1008908.335	134075.237

Parish reasonable reduction 87%

Bayou Macon - Arkansas State Line to Tensas River 081001

Coverage Type	Area km2	Percent of Watershed	Acres in West Carroll			existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	50% buffer	85% buffer
Deciduous Forest	17.47	1.90%	1248			83	0.004	1	77	0.002	1	414.1838313	192.121416
Evergreen Forest	8.48	0.92%	605			83	0.004	1	77	0.002	1	201.0213732	93.2448538
Forested Wetlands	45.38	4.95%	3240			NC	NC	NC	NC	NC	NC		
Mixed Forest	53.43	5.82%	3815			83	0.004	1	77	0.002	1	1266.662963	587.548483
Non Forested Wetlands	0.04	0.00%	3			NC	NC	NC	NC	NC	NC		
Other	0.27	0.03%	19			NC	NC	NC	NC	NC	NC		
Pasture	50.74	5.53%	3624			86.6	0.04	0.6	80.75	0.01	0.52	7531.150961	1521.5215
Row Crops	604.19	65.86%	43146			88.6	0.457571	0.6	85.75	0.2431429	0.52	1049493.994	467772.918
Small Grains	116.99	12.75%	8354			85.6	0.38	0.6	83.6	0.1871429	0.52	163046.8223	67965.2008
Urban	5.10	0.56%	364			NC	NC	NC	NC	NC	NC		
Water	15.30	1.67%	1093			NC	NC	NC	NC	NC	NC		
TOTAL	917.34	100%										1221953.836	538132.555
												610976.9179	80719.8833
Parish reasonable reduction												87%	

Summary for West Carroll

Coverage Type	Area km2	% of Parish in impaired Segs	Acres	sub-total acres	% county(99.1)	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	50% buffer	85% buffer
Deciduous Forest	62.82	1.71%	5051			83	0.004	1	77	0.002	1	1677.048631	777.9081
Evergreen Forest	27.55	0.75%	2242			83	0.004	1	77	0.002	1	744.3593818	345.275135
Forested Wetlands	366.86	9.97%	29223			NC	NC	NC	NC	NC	NC		
Mixed Forest	246.30	6.70%	21057	57574	18729.9	83	0.004	1	77	0.002	1	6990.967044	3242.79797
Non Forested Wetlands	1.75	0.05%	135			NC	NC	NC	NC	NC	NC		
Other	1.29	0.04%	98			NC	NC	NC	NC	NC	NC		
Pasture	145.61	3.96%	11203			86.6	0.04	0.6	80.75	0.01	0.52	23285.17922	4704.31426
Row Crops	2375.64	64.58%	194835	194835	68874.5	88.6	0.457571	0.6	85.75	0.2431429	0.52	4739273.306	2112354.83
Small Grains	366.42	9.96%	29339	29339	30147.211	85.6	0.38	0.6	83.6	0.1871429	0.52	572607.1134	238688.23
Urban	18.29	0.50%	1575			NC	NC	NC	NC	NC	NC		
Water	65.86	1.79%	5166			NC	NC	NC	NC	NC	NC		
TOTAL	3678.40	100.00%	299925		228227.3							5344577.973	2360113.35
												2672288.987	354017.003
Parish reasonable reduction												87%	

Buffer Strips: QAF grassy strips near waterways, no intentional buffer strips.
Rotational practices: Rice (2 or 1 y)/ soybean (1 y); rice (2 or 1y)/milo.
Tilling Practices: 60% no till.
Ranching and Other: No data.
Crops in order of % area: Cotton(29), Soybeans(25), Wheat(13), S. Potatoes(9), Sorghum(8), Corn(7), Rice(7)

Boeuf River - Arkansas State Line to Ouachita River 080901

Coverage Type	Area km2	Percent of Watershed	Acres in Morehouse	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	25% buffer	85% buffer
Deciduous Forest	29.38	1.79%	1590	83	0.004	1	77	0.002	1	527.8794832	244.85976
Evergreen Forest	10.45	0.64%	566	83	0.004	1	77	0.002	1	187.774204	87.1000826
Forested Wetlands	259.33	15.80%	14033	NC	NC	NC	NC	NC	NC		
Mixed Forest	69.76	4.25%	3775	83	0.004	1	77	0.002	1	1253.331773	581.364738
Non Forested Wetlands	1.71	0.10%	93	NC	NC	NC	NC	NC	NC		
Other	1.02	0.06%	55	NC	NC	NC	NC	NC	NC		
Pasture	81.07	4.94%	4387	87.32	0.04	0.6	80.75	0.01	0.52	9193.333529	1842.01822
Row Crops	986.90	60.12%	53405	89.32	0.448831	0.6	85.75	0.2561039	0.52	1284596.732	609870.318
Small Grains	158.38	9.65%	8571	86.32	0.405909	0.6	83.6	0.2627273	0.52	180178.6205	97887.3511
Urban	3.13	0.19%	169	NC	NC	NC	NC	NC	NC		
Water	41.49	2.53%	2245	NC	NC	NC					
TOTAL	1641.60	100%								1475937.671	710513.012
										1106953.254	106576.952

Parish reasonable reduction 90%

Bayou Lafourche - Near Oakridge to Boeuf River near 080904

Coverage Type	Area km2	Percent of Watershed	Acres in Morehouse	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	25% buffer	85% buffer
Deciduous Forest	54.46	3.72%	3755	83	0.004	1	77	0.002	1	1246.564141	578.225535
Evergreen Forest	64.30	4.39%	4433	83	0.004	1	77	0.002	1	1471.652241	682.633871
Forested Wetlands	253.12	17.30%	17450	NC	NC	NC	NC	NC	NC		
Mixed Forest	102.88	7.03%	7093	83	0.004	1	77	0.002	1	2354.721862	1092.2505
Non Forested Wetlands	2.72	0.19%	188	NC	NC	NC	NC	NC	NC		
Other	3.74	0.26%	258	NC	NC	NC	NC	NC	NC		
Pasture	177.99	12.16%	12270	87.32	0.04	0.6	80.75	0.01	0.52	25714.69175	5152.31288
Row Crops	590.72	40.37%	40724	89.32	0.448831	0.6	85.75	0.2561039	0.52	979562.0949	465053.22
Small Grains	108.44	7.41%	7476	86.32	0.405909	0.6	83.6	0.2627273	0.52	157161.1361	85382.4236
Urban	75.33	5.15%	5193	NC	NC	NC	NC	NC	NC		
Water	32.21	2.20%	2221	NC	NC	NC	NC	NC	NC		
TOTAL	1463.19	100%								1167510.861	557941.066
										875633.1457	83691.1599

Parish reasonable reduction 90%

Summary for Morehouse

Coverage Type	Area km2	% of Parish in impaired Segs	Acres		% county(49.8)	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	25% buffer	85% buffer
Deciduous Forest	83.85	2.70%	5345			83	0.004	1	77	0.002	1	1774.443624	823.085295
Evergreen Forest	74.75	2.40%	4998			83	0.004	1	77	0.002	1	1659.426445	769.733953
Forested Wetlands	512.45	16.49%	31484			NC	NC	NC	NC	NC	NC		
Mixed Forest	172.64	5.55%	10868	52694	90436.8	83	0.004	1	77	0.002	1	3608.053635	1673.61524
Non Forested Wetlands	4.43	0.14%	280			NC	NC	NC	NC	NC	NC		
Other	4.77	0.15%	313			NC	NC	NC	NC	NC	NC		
Pasture	259.05	8.33%	16657			87.32	0.04	0.6	80.75	0.01	0.52	34908.02527	6994.33111
Row Crops	1577.61	50.75%	94129	94129	75681.06	89.32	0.448831	0.6	85.75	0.2561039	0.52	2264158.827	1074923.54
Small Grains	266.82	8.58%	16046	16046	22463.286	86.32	0.405909	0.6	83.6	0.2627273	0.52	337339.7566	183269.775
Urban	78.46	2.52%	5363			NC	NC	NC	NC	NC	NC		
Water	73.70	2.37%	4466			NC	NC	NC	NC	NC	NC		
TOTAL	3108.53	100.00%	189949		257117.4							2643448.532	1268454.08
												1982586.399	190268.112

Parish reasonable reduction 90%

Buffer Strips: 25% do use some kind of buffer strip such as grass on turn rows or grass waterways.
Rotational practices:
Tilling Practices: 40-45% use minimum till or no till and stale beds.
Ranching and Other:
Crops in order of % area: Cotton(39), Soybeans(24), Rice (13), Corn(12), Sorghum(9), S. Potatoes(2)

Bayou Macon - Arkansas State Line to Tensas River 081001

Coverage Type	Area km2	Percent of Watershed	Acres in East Carroll		existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	40% buffers	85% buffers
Deciduous Forest	17.47	1.90%	902		83	0.004	1	77	0.002	1	299.5308676	138.939017
Evergreen Forest	8.48	0.92%	438		83	0.004	1	77	0.002	1	145.3753183	67.4331296
Forested Wetlands	45.38	4.95%	2343		NC	NC	NC	NC	NC	NC		
Mixed Forest	53.43	5.82%	2759		83	0.004	1	77	0.002	1	916.0296169	424.905304
Non Forested Wetlands	0.04	0.00%	2		NC	NC	NC	NC	NC	NC		
Other	0.27	0.03%	14		NC	NC	NC	NC	NC	NC		
Pasture	50.74	5.53%	2620		86.2	0.04	0.6	80.75	0.01	0.52	5421.246693	1100.33908
Row Crops	604.19	65.86%	31202		88.2	0.471266	0.6	85.75	0.2431429	0.52	778162.5223	338285.605
Small Grains	116.99	12.75%	6042		85.2	0.41	0.6	83.6	0.2219048	0.52	126627.1618	58281.1904
Urban	5.10	0.56%	263		NC	NC	NC	NC	NC	NC		
Water	15.30	1.67%	790		NC	NC	NC	NC	NC	NC		
TOTAL	917.34	100%									911571.8666	398298.412
											546943.1199	59744.7618

Parish reasonable reduction 89%

Joe's Bayou - Headwaters to Bayou Macon 081002

Coverage Type	Area km2	Percent of Watershed	Acres in East Carroll	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	40% buffers	85% buffers
Deciduous Forest	2.15	0.87%	63	83	0.004	1	77	0.002	1	20.830945	9.66254678
Evergreen Forest	5.08	2.05%	148	83	0.004	1	77	0.002	1	49.19797005	22.8207451
Forested Wetlands	2.64	1.07%	77	NC	NC	NC	NC	NC	NC		
Mixed Forest	7.46	3.02%	218	83	0.004	1	77	0.002	1	72.23310956	33.5057195
Non Forested Wetlands	0.02	0.01%	0	NC	NC	NC	NC	NC	NC		
Other	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Pasture	22.89	9.25%	668	86.2	0.04	0.6	80.75	0.01	0.52	1380.997152	280.298097
Row Crops	140.02	56.59%	4083	88.2	0.471266	0.6	85.75	0.2431429	0.52	101815.5498	44261.6213
Small Grains	62.30	25.18%	1817	85.2	0.41	0.6	83.6	0.2219048	0.52	38074.59148	17524.1432
Urban	0.14	0.06%	4	NC	NC	NC	NC	NC	NC		
Water	4.73	1.91%	138	NC	NC	NC	NC	NC	NC		
TOTAL	247.44	100%								141413.4005	62132.0517
										84848.04029	9319.80775

Parish reasonable reduction 89%

Tensas River - Headwaters to Jonesville (including 081201

Coverage Type	Area km2	Percent of Watershed	Acres in East Carroll	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	40% buffers	85% buffers
Deciduous Forest	24.98	0.80%	2518	83	0.004	1	77	0.002	1	835.9312083	387.751223
Evergreen Forest	12.21	0.39%	1231	83	0.004	1	77	0.002	1	408.6272735	189.543976
Forested Wetlands	707.15	22.71%	71292	NC	NC	NC	NC	NC	NC		
Mixed Forest	25.32	0.81%	2552	83	0.004	1	77	0.002	1	847.4083179	393.074943
Non Forested Wetlands	25.15	0.81%	2535	NC	NC	NC	NC	NC	NC		
Other	1.04	0.03%	105	NC	NC	NC	NC	NC	NC		
Pasture	148.48	4.77%	14969	86.2	0.04	0.6	80.75	0.01	0.52	30967.68532	6285.44618
Row Crops	1946.49	62.50%	196236	88.2	0.471266	0.6	85.75	0.2431429	0.52	4894004.683	2127539.29
Small Grains	166.44	5.34%	16780	85.2	0.41	0.6	83.6	0.2219048	0.52	351698.3466	161872.05
Urban	15.90	0.51%	1603	NC	NC	NC	NC	NC	NC		
Water	42.24	1.36%	4259	NC	NC	NC	NC	NC	NC		
TOTAL	3114.35	100%								5278762.681	2296667.15
										3167257.609	344500.073

Parish reasonable reduction 89%

Summary for East Carroll

Coverage Type	Area km2	% of Parish in impaired Segs	Acres		% par(73.5)	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	40% buffers	85% buffers
Deciduous Forest	44.60	1.04%	3483			83	0.004	1	77	0.002	1	1156.293021	536.352787
Evergreen Forest	25.77	0.60%	1817			83	0.004	1	77	0.002	1	603.2005619	279.797851
Forested Wetlands	755.17	17.64%	73713			NC	NC	NC	NC	NC	NC		
Mixed Forest	86.21	2.01%	5529	84541	53949	83	0.004	1	77	0.002	1	1835.671044	851.485966
Non Forested Wetlands	25.20	0.59%	2538			NC	NC	NC	NC	NC	NC		
Other	1.31	0.03%	119			NC	NC	NC	NC	NC	NC		
Pasture	222.11	5.19%	18257			86.2	0.04	0.6	80.75	0.01	0.52	37769.92916	7666.08336
Row Crops	2690.69	62.86%	231521	231521	111171.69	88.2	0.471266	0.6	85.75	0.2431429	0.52	5773982.755	2510086.51
Small Grains	345.74	8.08%	24638	24638	30052.68	85.2	0.41	0.6	83.6	0.2219048	0.52	516400.0999	237677.384
Urban	21.14	0.49%	1870			NC	NC	NC	NC	NC	NC		
Water	62.27	1.45%	5187			NC	NC	NC	NC	NC	NC		
TOTAL	4280.22		368671		200214							6331747.948	2757097.62
												3799048.769	413564.642
Parish reasonable reduction												89%	

Buffer Strips: CEA reported that "a number" of farmers do use buffer strips.
Rotational practices: They rotate corn, milo, beans and cotton. Typical rotation: cotton (2 y)/corn (1y).
Tilling Practices: Most do use minimal till; all use some kind of till, but keep it to a minimum.
Ranching and Other: Approximately 2,500 head of cattle on 5,000 acres of pasture (which is largely on the MS river levee.)
Crops in order of % area: Soybeans(41), Cotton(24), Corn(14), Sorghum(9), Rice (8), Wheat(4)

Bayou Chauvin - Headwaters to the Ouachita River 080102

Coverage Type	Area km2	Percent of Watershed	Acres in Ouachita		existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	75% buffers	85% buffers
Deciduous Forest	7.68	8.16%	108		83	0.004	1	77	0.002	1	35.92	16.66
Evergreen Forest	3.15	3.35%	44		83	0.004	1	77	0.002	1	14.74	6.84
Forested Wetlands	6.71	7.13%	95		NC	NC	NC	NC	NC	NC		
Mixed Forest	19.12	20.31%	269		83	0.004	1	77	0.002	1	89.43	41.48
Non Forested Wetlands	0.00	0.00%	0		NC	NC	NC	NC	NC	NC		
Other	0.12	0.12%	2		NC	NC	NC	NC	NC	NC		
Pasture	28.29	30.05%	398		86	0.04	0.6	80.75	0.01	0.52	822.50	167.33
Row Crops	14.58	15.48%	205		88	0.447246	0.6	85.75	0.2692754	0.52	4848.41	2465.20
Small Grains	0.29	0.31%	4		85	0.36	0.6	83.6	0.2933333	0.52	76.10	52.86
Urban	11.74	12.46%	165		NC	NC	NC	NC	NC	NC		
Water	2.48	2.64%	35		NC	NC	NC	NC	NC	NC		
TOTAL	94.17	100%									5887.10	2750.37
											1471.78	412.56
Parish reasonable reduction											72%	

Bayou Lafourche - Near Oakridge to Boeuf River near 080904

Coverage Type	Area km2	Percent of Watershed	Acres in Ouachita		existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	75% buffers	85% buffers
Deciduous Forest	54.46	3.72%	4105		83	0.004	1	77	0.002	1	1362.73	632.11
Evergreen Forest	64.30	4.39%	4846		83	0.004	1	77	0.002	1	1608.80	746.25
Forested Wetlands	253.12	17.30%	19076		NC	NC	NC	NC	NC	NC		
Mixed Forest	102.88	7.03%	7753		83	0.004	1	77	0.002	1	2574.16	1194.04
Non Forested Wetlands	2.72	0.19%	205		NC	NC	NC	NC	NC	NC		
Other	3.74	0.26%	282		NC	NC	NC	NC	NC	NC		
Pasture	177.99	12.16%	13414		86	0.04	0.6	80.75	0.01	0.52	27686.09	5632.46
Row Crops	590.72	40.37%	44519		88	0.447246	0.6	85.75	0.2692754	0.52	1051296.91	534538.17
Small Grains	108.44	7.41%	8172		85	0.36	0.6	83.6	0.2933333	0.52	150045.17	104212.63
Urban	75.33	5.15%	5677		NC	NC	NC	NC	NC	NC		
Water	32.21	2.20%	2428		NC	NC	NC	NC	NC	NC		
TOTAL	1463.19	100%									1234573.86	646955.66
											308643.46	97043.35
Parish reasonable reduction											69%	

Summary for Ouachita Parish

Coverage Type	Area km2	% of Parish in impaired Segs	Acres		% par(36.3)	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	75% buffers	85% buffers
Deciduous Forest	62.15	1.45%	4213			83	0.004	1	77	0.002	1	1398.65	648.77
Evergreen Forest	67.45	1.58%	4890			83	0.004	1	77	0.002	1	1623.53	753.08
Forested Wetlands	259.83	6.07%	19171			NC	NC	NC	NC	NC	NC		
Mixed Forest	122.00	2.85%	8023	36297	93109.5	83	0.004	1	77	0.002	1	2663.58	1235.52
Non Forested Wetlands	2.72	0.06%	205			NC	NC	NC	NC	NC	NC		
Other	3.86	0.09%	284			NC	NC	NC	NC	NC	NC		
Pasture	206.28	4.82%	13812			86	0.04	0.6	80.75	0.01	0.52	28508.59	5799.79
Row Crops	605.29	14.14%	44724	44724	10529.178	88	0.447246	0.6	85.75	0.2692754	0.52	1056145.32	537003.38
Small Grains	108.73	2.54%	8177	8177	4365.438	85	0.36	0.6	83.6	0.2933333	0.52	150121.27	104265.49
Urban	87.07	2.03%	5843			NC	NC	NC	NC	NC	NC		
Water	34.69	0.81%	2463			NC	NC	NC	NC	NC	NC		
TOTAL	1560.08		111804		145635.6							1240460.96	649706.03
												310115.24	97455.90
Parish reasonable reduction												69%	

Buffer Strips: Almost all use at least a turn row or ditch bank that is allowed to revegetate in grass or other controlled vegetation.
Rotational practices: Little or no rotation, more rotation with soybeans, milo and corn; but mostly driven by economics - no pattern.
Tilling Practices: All farmers use some kind of low till practice such as stale beds.
Ranching and Other: 1 cow/ 2 to 3 acres on 2,750 acres, 110 dairy cows, 425 horses.
Crops in order of % area: Cotton(38), Soybeans(26), Rice (17), Hay(8), Corn(5), Sorghum(4)

Boeuf River - Arkansas State Line to Ouachita River 080901

Coverage Type	Area km2	Percent of Watershed	Acres in Richland	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	10% buffers	85% buffers
Deciduous Forest	29.38	1.79%	2381	83	0.004	1	77	0.002	1	790.61	366.73
Evergreen Forest	10.45	0.64%	847	83	0.004	1	77	0.002	1	281.23	130.45
Forested Wetlands	259.33	15.80%	21018	NC	NC	NC	NC	NC	NC		
Mixed Forest	69.76	4.25%	5654	83	0.004	1	77	0.002	1	1877.14	870.72
Non Forested Wetlands	1.71	0.10%	139	NC	NC	NC	NC	NC	NC		
Other	1.02	0.06%	83	NC	NC	NC	NC	NC	NC		
Pasture	81.07	4.94%	6570	85.8	0.04	0.6	80.75	0.01	0.52	13529.33	2758.82
Row Crops	986.90	60.12%	79986	87.8	0.418551	0.6	85.75	0.2782609	0.52	1763629.82	992437.53
Small Grains	158.38	9.65%	12836	84.8	0.376538	0.6	83.6	0.1823077	0.52	245922.33	101731.66
Urban	3.13	0.19%	253	NC	NC	NC	NC	NC	NC		
Water	41.49	2.53%	3363	NC	NC	NC	NC	NC	NC		
TOTAL	1641.60	100%								2026030.46	1098295.91
										1823427.42	164744.39
Parish reasonable reduction										91%	

Big Creek - Headwaters to Boeuf River (including Big 080903

Coverage Type	Area km2	Percent of Watershed	Acres in Richland	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	10% buffers	85% buffers
Deciduous Forest	15.97	1.43%	1771	83	0.004	1	77	0.002	1	588.09	272.79
Evergreen Forest	8.62	0.77%	956	83	0.004	1	77	0.002	1	317.55	147.30
Forested Wetlands	62.15	5.56%	6896	NC	NC	NC	NC	NC	NC		
Mixed Forest	123.11	11.01%	13658	83	0.004	1	77	0.002	1	4534.60	2103.40
Non Forested Wetlands	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Other	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Pasture	13.80	1.23%	1531	85.8	0.04	0.6	80.75	0.01	0.52	3153.51	643.05
Row Crops	784.55	70.15%	87043	87.8	0.418551	0.6	85.75	0.2782609	0.52	1919243.19	1080004.97
Small Grains	91.06	8.14%	10102	84.8	0.376538	0.6	83.6	0.1823077	0.52	193542.67	80063.56
Urban	10.06	0.90%	1116	NC	NC	NC	NC	NC	NC		
Water	9.07	0.81%	1007	NC	NC	NC	NC	NC	NC		
TOTAL	1118.40	100%								2121379.61	1163235.06
										1909241.65	174485.26
Parish reasonable reduction										91%	

Bayou Lafourche - Near Oakridge to Boeuf River near 080904

Coverage Type	Area km2	Percent of Watershed	Acres in Richland	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	10% buffers	85% buffers
Deciduous Forest	54.46	3.72%	1346	83	0.004	1	77	0.002	1	446.80	207.25
Evergreen Forest	64.30	4.39%	1589	83	0.004	1	77	0.002	1	527.47	244.67
Forested Wetlands	253.12	17.30%	6255	NC	NC	NC	NC	NC	NC		
Mixed Forest	102.88	7.03%	2542	83	0.004	1	77	0.002	1	843.99	391.49
Non Forested Wetlands	2.72	0.19%	67	NC	NC	NC	NC	NC	NC		
Other	3.74	0.26%	93	NC	NC	NC	NC	NC	NC		
Pasture	177.99	12.16%	4398	85.8	0.04	0.6	80.75	0.01	0.52	9056.30	1846.71
Row Crops	590.72	40.37%	14596	87.8	0.418551	0.6	85.75	0.2782609	0.52	321838.99	181106.65
Small Grains	108.44	7.41%	2679	84.8	0.376538	0.6	83.6	0.1823077	0.52	51334.10	21235.58
Urban	75.33	5.15%	1861	NC	NC	NC	NC	NC	NC		
Water	32.21	2.20%	796	NC	NC	NC	NC	NC	NC		
TOTAL	1463.19	100%								384047.65	205032.35
										345642.88	30754.85

Parish reasonable reduction 91%

Bayou Macon - Arkansas State Line to Tensas River 081001

Coverage Type	Area km2	Percent of Watershed	Acres in Richland	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	10% buffers	85% buffers
Deciduous Forest	17.47	1.90%	186	83	0.004	1	77	0.002	1	61.63	28.59
Evergreen Forest	8.48	0.92%	90	83	0.004	1	77	0.002	1	29.91	13.87
Forested Wetlands	45.38	4.95%	482	NC	NC	NC	NC	NC	NC		
Mixed Forest	53.43	5.82%	568	83	0.004	1	77	0.002	1	188.47	87.42
Non Forested Wetlands	0.04	0.00%	0	NC	NC	NC	NC	NC	NC		
Other	0.27	0.03%	3	NC	NC	NC	NC	NC	NC		
Pasture	50.74	5.53%	539	85.8	0.04	0.6	80.75	0.01	0.52	1110.20	226.39
Row Crops	604.19	65.86%	6420	87.8	0.418551	0.6	85.75	0.2782609	0.52	141546.97	79651.93
Small Grains	116.99	12.75%	1243	84.8	0.376538	0.6	83.6	0.1823077	0.52	23813.91	9851.20
Urban	5.10	0.56%	54	NC	NC	NC	NC	NC	NC		
Water	15.30	1.67%	163	NC	NC	NC	NC	NC	NC		
TOTAL	917.34	100%								166751.08	89859.39
										150075.97	13478.91

Parish reasonable reduction 91%

Summary for Richland

Coverage Type	Area km2	% of Parish in impaired Segs	Acres		% par(92)	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	10% buffers	85% buffers
Deciduous Forest	117.28	2.74%	5684			83	0.004	1	77	0.002	1	1887.13	875.36
Evergreen Forest	91.85	2.15%	3482			83	0.004	1	77	0.002	1	1156.17	536.29
Forested Wetlands	619.99	14.48%	34651			NC	NC	NC	NC	NC	NC		
Mixed Forest	349.18	8.16%	22422	66240	62560	83	0.004	1	77	0.002	1	7444.18	3453.02
Non Forested Wetlands	4.47	0.10%	206			NC	NC	NC	NC	NC	NC		
Other	5.04	0.12%	178			NC	NC	NC	NC	NC	NC		
Pasture	323.60	7.56%	13039			85.8	0.04	0.6	80.75	0.01	0.52	26849.34	5474.96
Row Crops	2966.36	69.30%	188045	188045	82122.88	87.8	0.418551	0.6	85.75	0.2782609	0.52	4146258.96	2333201.08
Small Grains	474.86	11.09%	26861	26861	37036.44	84.8	0.376538	0.6	83.6	0.1823077	0.52	514613.01	212882.00
Urban	93.62	2.19%	3285			NC	NC	NC	NC	NC	NC		
Water	98.08	2.29%	5328			NC	NC	NC	NC	NC	NC		
TOTAL	5144.32		303183		331476							4698208.80	2556422.71
												4228387.92	383463.41

Parish reasonable reduction 91%

Buffer Strips: Very few; those that do exist are created unintentionally.
Rotational practices: No data
Tilling Practices: 80% use some kind of reduced or no till.
Ranching and Other: 9,500 breeding cows at 1 cow/1.5 acres.
Crops in order of % area: Cotton(53), Corn(16), Wheat(13), Sorghum(7), Rice (6), Hay(4)

Bayou Macon - Arkansas State Line to Tensas River 081001

Coverage Type	Area km2	Percent of Watershed	Acres in Madison	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	55% buffers	85% buffers
Deciduous Forest	17.47	1.90%	99	83	0.004	1	77	0.002	1	32.96	15.29
Evergreen Forest	8.48	0.92%	48	83	0.004	1	77	0.002	1	16.00	7.42
Forested Wetlands	45.38	4.95%	258	NC	NC	NC	NC	NC	NC		
Mixed Forest	53.43	5.82%	304	83	0.004	1	77	0.002	1	100.81	46.76
Non Forested Wetlands	0.04	0.00%	0	NC	NC	NC	NC	NC	NC		
Other	0.27	0.03%	2	NC	NC	NC	NC	NC	NC		
Pasture	50.74	5.53%	288	86.4	0.04	0.6	80.75	0.01	0.52	597.98	121.09
Row Crops	604.19	65.86%	3434	88.4	0.461099	0.6	85.75	0.2279121	0.52	83977.64	34895.62
Small Grains	116.99	12.75%	665	85.4	0.436667	0.6	83.6	0.1977778	0.52	14876.23	5716.38
Urban	5.10	0.56%	29	NC	NC	NC	NC	NC	NC		
Water	15.30	1.67%	87	NC	NC	NC	NC	NC	NC		
TOTAL	917.34	100%								99601.62	40802.56
										44820.73	6120.38

Parish reasonable reduction 86%

Joe's Bayou - Headwaters to Bayou Macon 081002

Coverage Type	Area km2	Percent of Watershed	Acres in Madison	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	55% buffers	85% buffers
Deciduous Forest	2.15	0.87%	30	83	0.004	1	77	0.002	1	10.06	4.67
Evergreen Forest	5.08	2.05%	72	83	0.004	1	77	0.002	1	23.77	11.02
Forested Wetlands	2.64	1.07%	37	NC	NC	NC	NC	NC	NC		
Mixed Forest	7.46	3.02%	105	83	0.004	1	77	0.002	1	34.89	16.18
Non Forested Wetlands	0.02	0.01%	0	NC	NC	NC	NC	NC	NC		
Other	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Pasture	22.89	9.25%	322	86.4	0.04	0.6	80.75	0.01	0.52	668.64	135.40
Row Crops	140.02	56.59%	1972	88.4	0.461099	0.6	85.75	0.2279121	0.52	48230.17	20041.31
Small Grains	62.30	25.18%	878	85.4	0.436667	0.6	83.6	0.1977778	0.52	19634.17	7544.67
Urban	0.14	0.06%	2	NC	NC	NC	NC	NC	NC		
Water	4.73	1.91%	67	NC	NC	NC	NC	NC	NC		
TOTAL	247.44	100%								68601.70	27753.25
										30870.76	4162.99

Parish reasonable reduction 87%

Tensas River - Headwaters to Jonesville (including 081201

Coverage Type	Area km2	Percent of Watershed	Acres in Madison	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	55% buffers	85% buffers
Deciduous Forest	24.98	0.80%	4517	83	0.004	1	77	0.002	1	1499.76	695.67
Evergreen Forest	12.21	0.39%	2208	83	0.004	1	77	0.002	1	733.13	340.06
Forested Wetlands	707.15	22.71%	127906	NC	NC	NC	NC	NC	NC		
Mixed Forest	25.32	0.81%	4579	83	0.004	1	77	0.002	1	1520.35	705.22
Non Forested Wetlands	25.15	0.81%	4548	NC	NC	NC	NC	NC	NC		
Other	1.04	0.03%	188	NC	NC	NC	NC	NC	NC		
Pasture	148.48	4.77%	26856	86.4	0.04	0.6	80.75	0.01	0.52	55688.58	11276.83
Row Crops	1946.49	62.50%	352070	88.4	0.461099	0.6	85.75	0.2279121	0.52	8610475.21	3577950.68
Small Grains	166.44	5.34%	30106	85.4	0.436667	0.6	83.6	0.1977778	0.52	673605.62	258841.35
Urban	15.90	0.51%	2875	NC	NC	NC	NC	NC	NC		
Water	42.24	1.36%	7641	NC	NC	NC	NC	NC	NC		
TOTAL	3114.35	100%								9343522.65	3849809.82
										4204585.19	577471.47

Parish reasonable reduction 86%

Lake St. Joseph (Oxbow Lake) 081202

Coverage Type	Area km2	Percent of Watershed	Acres in Madison			existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	55% buffers	85% buffers
Deciduous Forest	1.12	0.39%	3			83	0.004	1	77	0.002	1	1.007887027	0.46751386
Evergreen Forest	0.60	0.21%	2			83	0.004	1	77	0.002	1	0.537648036	0.24939096
Forested Wetlands	68.19	23.77%	185			NC	NC	NC	NC	NC	NC		
Mixed Forest	2.68	0.93%	7			83	0.004	1	77	0.002	1	2.418604003	1.12188258
Non Forested Wetlands	1.30	0.45%	4			NC	NC	NC	NC	NC	NC		
Other	0.00	0.00%	0			NC	NC	NC	NC	NC	NC		
Pasture	7.62	2.66%	21			86.4	0.04	0.6	80.75	0.01	0.52	42.9645616	8.70024085
Row Crops	190.67	66.46%	518			88.4	0.461099	0.6	85.75	0.2279121	0.52	12674.77799	5266.80926
Small Grains	6.29	2.19%	17			85.4	0.436667	0.6	83.6	0.1977778	0.52	382.3204799	146.911406
Urban	1.73	0.60%	5			NC	NC	NC	NC	NC	NC		
Water	6.69	2.33%	18			NC	NC	NC	NC	NC	NC		
TOTAL	286.89	100%										13104.02717	5424.25969
												5896.812227	813.638954
Parish reasonable reduction												86%	

Summary for Madison

Coverage Type	Area km2	% of Parish in impaired Segs	Acres		% par(82.4)	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	55% buffers	85% buffers
Deciduous Forest	45.71	1.07%	4650			83	0.004	1	77	0.002	1	1543.791952	716.096267
Evergreen Forest	26.37	0.62%	2330			83	0.004	1	77	0.002	1	773.4264125	358.758035
Forested Wetlands	823.37	19.24%	128387			NC	NC	NC	NC	NC	NC		
Mixed Forest	88.89	2.08%	4995	140362	97891.2	83	0.004	1	77	0.002	1	1658.468173	769.289454
Non Forested Wetlands	26.51	0.62%	4552			NC	NC	NC	NC	NC	NC		
Other	1.31	0.03%	189			NC	NC	NC	NC	NC	NC		
Pasture	229.74	5.37%	27488			86.4	0.04	0.6	80.75	0.01	0.52	56998.16439	11542.0183
Row Crops	2881.36	67.32%	357994	357994	155329.768	88.4	0.461099	0.6	85.75	0.2279121	0.52	8755357.799	3638154.42
Small Grains	352.02	8.22%	31665	31665	15490.376	85.4	0.436667	0.6	83.6	0.1977778	0.52	708498.3455	272249.313
Urban	22.87	0.53%	2911			NC	NC	NC	NC	NC	NC		
Water	68.96	1.61%	7813			NC	NC	NC	NC	NC	NC		
TOTAL	4567.10		572974		348469.6							9524829.996	3923789.89
												4286173.498	588568.484
Parish reasonable reduction												86%	

Buffer Strips: Largest commerical crop producing parish in LA. Approx. 50-60% of farmers use some kind of buffer strips.
Rotational practices: Approx. 90 - 100% do rotate their crops.
Tilling Practices: Approx. 60-70% use some kind of minimal till practices; a couple use no till.
Ranching and Other: 2,500-3,000 head of breeder cows at approx. 1 cow & calf per 2 acres
Crops in order of % area: Cotton(32), Corn(31), Soybeans(28), Sorghum(5), Rice (2), Wheat(2)

Boeuf River - Arkansas State Line to Ouachita River 080901

Coverage Type	Area km2	Percent of Watershed	Acres in Franklin	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	33% buffers	85% buffers
Deciduous Forest	29.38	1.79%	784	83	0.004	1	77	0.002	1	260.3241287	120.752758
Evergreen Forest	10.45	0.64%	279	83	0.004	1	77	0.002	1	92.60097732	42.9534654
Forested Wetlands	259.33	15.80%	6921	NC	NC	NC	NC	NC	NC		
Mixed Forest	69.76	4.25%	1862	83	0.004	1	77	0.002	1	618.0814221	286.700419
Non Forested Wetlands	1.71	0.10%	46	NC	NC	NC	NC	NC	NC		
Other	1.02	0.06%	27	NC	NC	NC	NC	NC	NC		
Pasture	81.07	4.94%	2163	86	0.04	0.6	80.75	0.01	0.52	4465.163657	908.392548
Row Crops	986.90	60.12%	26337	88	0.493333	0.6	85.75	0.1755556	0.52	686021.7156	206165.281
Small Grains	158.38	9.65%	4227	85	0.39	0.6	83.6	0.14	0.52	84067.13003	25723.4429
Urban	3.13	0.19%	83	NC	NC	NC	NC	NC	NC		
Water	41.49	2.53%	1107	NC	NC	NC	NC	NC	NC		
TOTAL	1641.60	100%								775525.0158	233247.523
										519601.7606	34987.1284

Parish reasonable reduction 93%

Big Creek - Headwaters to Boeuf River (including Big 080903

Coverage Type	Area km2	Percent of Watershed	Acres in Franklin	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	33% buffers	85% buffers
Deciduous Forest	15.97	1.43%	252	83	0.004	1	77	0.002	1	83.82643143	38.8833447
Evergreen Forest	8.62	0.77%	136	83	0.004	1	77	0.002	1	45.26343781	20.995691
Forested Wetlands	62.15	5.56%	983	NC	NC	NC	NC	NC	NC		
Mixed Forest	123.11	11.01%	1947	83	0.004	1	77	0.002	1	646.3565996	299.816013
Non Forested Wetlands	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Other	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Pasture	13.80	1.23%	218	86	0.04	0.6	80.75	0.01	0.52	450.5462606	91.6590963
Row Crops	784.55	70.15%	12407	88	0.493333	0.6	85.75	0.1755556	0.52	323179.7643	97122.9414
Small Grains	91.06	8.14%	1440	85	0.39	0.6	83.6	0.14	0.52	28641.03382	8763.78196
Urban	10.06	0.90%	159	NC	NC	NC	NC	NC	NC		
Water	9.07	0.81%	143	NC	NC	NC	NC	NC	NC		
TOTAL	1118.40	100%								353046.7908	106338.077
										236541.3499	15950.7116

Parish reasonable reduction 93%

Bayou Macon - Arkansas State Line to Tensas River 081001

Coverage Type	Area km2	Percent of Watershed	Acres in Franklin	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	33% buffers	85% buffers
Deciduous Forest	17.47	1.90%	794	83	0.004	1	77	0.002	1	263.7018165	122.319517
Evergreen Forest	8.48	0.92%	385	83	0.004	1	77	0.002	1	127.9859262	59.3669658
Forested Wetlands	45.38	4.95%	2063	NC	NC	NC	NC	NC	NC		
Mixed Forest	53.43	5.82%	2429	83	0.004	1	77	0.002	1	806.4566962	374.079311
Non Forested Wetlands	0.04	0.00%	2	NC	NC	NC	NC	NC	NC		
Other	0.27	0.03%	12	NC	NC	NC	NC	NC	NC		
Pasture	50.74	5.53%	2307	86	0.04	0.6	80.75	0.01	0.52	4761.698491	968.719572
Row Crops	604.19	65.86%	27470	88	0.493333	0.6	85.75	0.1755556	0.52	715534.2888	215034.487
Small Grains	116.99	12.75%	5319	85	0.39	0.6	83.6	0.14	0.52	105793.3795	32371.3912
Urban	5.10	0.56%	232	NC	NC	NC	NC	NC	NC		
Water	15.30	1.67%	696	NC	NC	NC	NC	NC	NC		
TOTAL	917.34	100%								827287.5113	248930.363
										554282.6326	37339.5545

Parish reasonable reduction 93%

Tensas River - Headwaters to Jonesville (including 081201

Coverage Type	Area km2	Percent of Watershed	Acres in Franklin	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	33% buffers	85% buffers
Deciduous Forest	24.98	0.80%	666	83	0.004	1	77	0.002	1	221.2759081	102.64003
Evergreen Forest	12.21	0.39%	326	83	0.004	1	77	0.002	1	108.166043	50.1734055
Forested Wetlands	707.15	22.71%	18871	NC	NC	NC	NC	NC	NC		
Mixed Forest	25.32	0.81%	676	83	0.004	1	77	0.002	1	224.3139665	104.04925
Non Forested Wetlands	25.15	0.81%	671	NC	NC	NC	NC	NC	NC		
Other	1.04	0.03%	28	NC	NC	NC	NC	NC	NC		
Pasture	148.48	4.77%	3962	86	0.04	0.6	80.75	0.01	0.52	8178.309143	1663.79458
Row Crops	1946.49	62.50%	51945	88	0.493333	0.6	85.75	0.1755556	0.52	1353058.506	406625.156
Small Grains	166.44	5.34%	4442	85	0.39	0.6	83.6	0.14	0.52	88347.44623	27033.1637
Urban	15.90	0.51%	424	NC	NC	NC	NC	NC	NC		
Water	42.24	1.36%	1127	NC	NC	NC	NC	NC	NC		
TOTAL	3114.35	100%								1450138.017	435578.976
										971592.4714	65336.8465

Parish reasonable reduction 93%

Summary for Franklin

Coverage Type	Area km2	% of Parish in impaired Segs	Acres		% par(46.4)	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	33% buffers	85% buffers
Deciduous Forest	87.79	2.05%	2497			83	0.004	1	77	0.002	1	829.1282847	384.59565
Evergreen Forest	39.76	0.93%	1127			83	0.004	1	77	0.002	1	374.0163843	173.489528
Forested Wetlands	1074.02	25.09%	28838			NC	NC	NC	NC	NC	NC		
Mixed Forest	271.61	6.35%	6913	39375	41435.2	83	0.004	1	77	0.002	1	2295.208684	1064.64499
Non Forested Wetlands	26.90	0.63%	719			NC	NC	NC	NC	NC	NC		
Other	2.33	0.05%	67			NC	NC	NC	NC	NC	NC		
Pasture	294.09	6.87%	8651			86	0.04	0.6	80.75	0.01	0.52	17855.71755	3632.56579
Row Crops	4322.13	100.98%	118159	118159	35585.088	88	0.493333	0.6	85.75	0.1755556	0.52	3077794.274	924947.865
Small Grains	532.87	12.45%	15427	15427	21400.608	85	0.39	0.6	83.6	0.14	0.52	306848.9896	93891.7797
Urban	34.19	0.80%	899			NC	NC	NC	NC	NC	NC		
Water	108.11	2.53%	3074			NC	NC	NC	NC	NC	NC		
TOTAL	6793.80		186371		188662.4							3405997.335	1024094.94
												2282018.214	153614.241

Parish reasonable reduction 93%

Buffer Strips: Some farmers do have natural vegetation or grassy unplowed areas.
Rotational practices: Most farmers do use some kind of crop rotation , however, there is no pattern, it is based almost entirely on economics or to a lesser extent pest control.
Tilling Practices: 100% of the farmers use some kind of reduced till. Some use no till and stale seedbed practices.
Ranching and Other: Approx. 25,000 hd of cattle in parish; 1 cow/1 or 1.5 ac. CEA estimates there are approx. 37,000 ac in pastureland.
No chicken farms; 58,000 acres of catfish farm ponds.
Crops in order of % area: Corn(32), Soybeans(28), Hay(16), Wheat(14), Sorghum(7), S. Potatoes(3)

Boeuf River - Arkansas State Line to Ouachita River 080901

Coverage Type	Area km2	Percent of Watershed	Acres in Caldwell		existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	50% buffers	85% buffers
Deciduous Forest	29.38	1.79%	1031		83	0.004	1	77	0.002	1	342.2780211	158.767516
Evergreen Forest	10.45	0.64%	367		83	0.004	1	77	0.002	1	121.7531368	56.4758526
Forested Wetlands	259.33	15.80%	9099		NC	NC	NC	NC	NC	NC		
Mixed Forest	69.76	4.25%	2448		83	0.004	1	77	0.002	1	812.6626105	376.957958
Non Forested Wetlands	1.71	0.10%	60		NC	NC	NC	NC	NC	NC		
Other	1.02	0.06%	36		NC	NC	NC	NC	NC	NC		
Pasture	81.07	4.94%	2844		86	0.04	0.6	80.75	0.01	0.52	5870.863326	1194.36798
Row Crops	986.90	60.12%	34628		88	0.436143	0.6	85.75	0.2871429	0.52	797426.6685	443367.197
Small Grains	158.38	9.65%	5557		85	0.411304	0.6	83.6	0.1808696	0.52	116570.7266	43694.9395
Urban	3.13	0.19%	110		NC	NC	NC	NC	NC	NC		
Water	41.49	2.53%	1456		NC	NC	NC	NC	NC	NC		
TOTAL	1641.60	100%									921144.9522	488848.706
											460572.4761	73327.3059

Parish reasonable reduction 84%

Bayou Lafourche - Near Oakridge to Boeuf River near 080904

Coverage Type	Area km2	Percent of Watershed	Acres in Caldwell		existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	50% buffers	85% buffers
Deciduous Forest	54.46	3.72%	2315		83	0.004	1	77	0.002	1	768.4911549	356.468789
Evergreen Forest	64.30	4.39%	2733		83	0.004	1	77	0.002	1	907.2551448	420.835218
Forested Wetlands	253.12	17.30%	10758		NC	NC	NC	NC	NC	NC		
Mixed Forest	102.88	7.03%	4372		83	0.004	1	77	0.002	1	1451.656489	673.358733
Non Forested Wetlands	2.72	0.19%	116		NC	NC	NC	NC	NC	NC		
Other	3.74	0.26%	159		NC	NC	NC	NC	NC	NC		
Pasture	177.99	12.16%	7565		86	0.04	0.6	80.75	0.01	0.52	15613.14131	3176.33626
Row Crops	590.72	40.37%	25106		88	0.436143	0.6	85.75	0.2871429	0.52	578143.8742	321446.522
Small Grains	108.44	7.41%	4609		85	0.411304	0.6	83.6	0.1808696	0.52	96674.38534	36237.0686
Urban	75.33	5.15%	3202		NC	NC	NC	NC	NC	NC		
Water	32.21	2.20%	1369		NC	NC	NC	NC	NC	NC		
TOTAL	1463.19	100%									693558.8036	362310.59
											346779.4018	54346.5885

Parish reasonable reduction 84%

Summary for Caldwell

Coverage Type	Area km2	% of Parish in impaired Segs	Acres		% par(31.4)	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	50% buffers	85% buffers
Deciduous Forest	83.85	2.70%	3346			83	0.004	1	77	0.002	1	1110.769176	515.236305
Evergreen Forest	74.75	2.40%	3099			83	0.004	1	77	0.002	1	1029.008282	477.31107
Forested Wetlands	512.45	16.49%	19857			NC	NC	NC	NC	NC	NC		
Mixed Forest	172.64	5.55%	6820	33123	79756	83	0.004	1	77	0.002	1	2264.319099	1050.31669
Non Forested Wetlands	4.43	0.14%	176			NC	NC	NC	NC	NC	NC		
Other	4.77	0.15%	195			NC	NC	NC	NC	NC	NC		
Pasture	259.05	8.33%	10409			86	0.04	0.6	80.75	0.01	0.52	21484.00464	4370.70424
Row Crops	1577.61	50.75%	59734	59734	5138.924	88	0.436143	0.6	85.75	0.2871429	0.52	1375570.543	764813.72
Small Grains	266.82	8.58%	10166	10166	1978.2	85	0.411304	0.6	83.6	0.1808696	0.52	213245.1119	79932.0082
Urban	78.46	2.52%	3311			NC	NC	NC	NC	NC	NC		
Water	73.70	2.37%	2825			NC	NC	NC	NC	NC	NC		
TOTAL	3108.53	100.00%	119938		108612.6							1614703.756	851159.296
												807351.8779	127673.894

Parish reasonable reduction 84%

Buffer Strips: Some do use buffer strips; grass covered and riparian strips.
Rotational practices: Rotations are economically driven; 30-40% do rotate crops; cotton (1 y)/soybeans (1y)/corn (2 y);
most years cotton fields are kept in cotton.
Tilling Practices: 75% use low till; 25% use conventional till.
Ranching and Other: Approximately 300 farms with 20-25 head of cattle.
Crops in order of % area: Cotton(47), Soybeans(23), Sorghum(10), Wheat(9), Hay(4), Rice(4)

Tensas River - Headwaters to Jonesville (including 081201

Coverage Type	Area km2	Percent of Watershed	Acres in Tensas		existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	10% buffers	85% buffers
Deciduous Forest	24.98	0.80%	3697		83	0.004	1	77	0.002	1	1227.261749	569.272016
Evergreen Forest	12.21	0.39%	1807		83	0.004	1	77	0.002	1	599.9209236	278.276573
Forested Wetlands	707.15	22.71%	104666		NC	NC	NC	NC	NC	NC		
Mixed Forest	25.32	0.81%	3747		83	0.004	1	77	0.002	1	1244.111722	577.087967
Non Forested Wetlands	25.15	0.81%	3722		NC	NC	NC	NC	NC	NC		
Other	1.04	0.03%	154		NC	NC	NC	NC	NC	NC		
Pasture	148.48	4.77%	21976		86.8	0.04	0.6	80.75	0.01	0.52	45781.27292	9227.89771
Row Crops	1946.49	62.50%	288101		84.45	0.433229	0.6	85.75	0.2431429	0.52	6324320.213	3123519.69
Small Grains	166.44	5.34%	24636		85.8	0.32	0.6	83.6	0.12	0.52	405836.2166	128514.802
Urban	15.90	0.51%	2353		NC	NC	NC	NC	NC	NC		
Water	42.24	1.36%	6253		NC	NC	NC	NC	NC	NC		
TOTAL	3114.35	100%									6779008.997	3262687.02
											6101108.097	489403.053
Parish reasonable reduction											92%	

Lake St. Joseph (Oxbow Lake) 081202

Coverage Type	Area km2	Percent of Watershed	Acres in Tensas		existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	10% buffers	85% buffers
Deciduous Forest	1.12	0.39%	44		83	0.004	1	77	0.002	1	14.47692276	6.71519911
Evergreen Forest	0.60	0.21%	23		83	0.004	1	77	0.002	1	7.722580875	3.58216101
Forested Wetlands	68.19	23.77%	2662		NC	NC	NC	NC	NC	NC		
Mixed Forest	2.68	0.93%	105		83	0.004	1	77	0.002	1	34.73994841	16.1143134
Non Forested Wetlands	1.30	0.45%	51		NC	NC	NC	NC	NC	NC		
Other	0.00	0.00%	0		NC	NC	NC	NC	NC	NC		
Pasture	7.62	2.66%	298		86.8	0.04	0.6	80.75	0.01	0.52	619.9844104	124.967096
Row Crops	190.67	66.46%	7444		84.45	0.433229	0.6	85.75	0.2431429	0.52	163408.9171	80706.0604
Small Grains	6.29	2.19%	245		85.8	0.32	0.6	83.6	0.12	0.52	4043.16364	1280.33515
Urban	1.73	0.60%	67		NC	NC	NC	NC	NC	NC		
Water	6.69	2.33%	261		NC	NC	NC	NC	NC	NC		
TOTAL	286.89	100%									168129.0046	82137.7744
											151316.1041	12320.6662
Parish reasonable reduction											0.918576636	

Summary for Tensas

Coverage Type	Area km2	% of Parish in impaired Segs	Acres		% par(75.7)	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	10% buffers	85% buffers
Deciduous Forest	26.09	0.61%	3740			83	0.004	1	77	0.002	1	1241.738672	575.987215
Evergreen Forest	12.80	0.30%	1830			83	0.004	1	77	0.002	1	607.6435045	281.858734
Forested Wetlands	775.35	18.11%	107329			NC	NC	NC	NC	NC	NC		
Mixed Forest	28.00	0.65%	3852	116751	88114.8	83	0.004	1	77	0.002	1	1278.85167	593.202281
Non Forested Wetlands	26.45	0.62%	3773			NC	NC	NC	NC	NC	NC		
Other	1.04	0.02%	154			NC	NC	NC	NC	NC	NC		
Pasture	156.10	3.65%	22274			86.8	0.04	0.6	80.75	0.01	0.52	46401.25733	9352.8648
Row Crops	2137.16	49.93%	295545	295545	118945.896	84.45	0.433229	0.6	85.75	0.2431429	0.52	6487729.13	3204225.75
Small Grains	172.73	4.04%	24881	24881	5040.863	85.8	0.32	0.6	83.6	0.12	0.52	409879.3803	129795.137
Urban	17.63	0.41%	2421			NC	NC	NC	NC	NC	NC		
Water	48.93	1.14%	6514			NC	NC	NC	NC	NC	NC		
TOTAL	3402.28		472312		301664.5							6947138.002	3344824.8
												6252424.201	501723.72
Parish reasonable reduction												92%	

Buffer Strips: Very few use buffer strips.
Rotational practices: Very few rotate their crops.
Tilling Practices: 50-60% use reduced tilling an example is stale beds.
Ranching and Other: No data.
Crops in order of % area: Cotton(61), Corn(22), Soybeans(13), Wheat(4)

Bayou Louis - Headwaters to Ouachita 080202

Coverage Type	Area km2	Percent of Watershed	Acres in Catahoula		existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	33% buffers	85% buffers
Deciduous Forest	11.57	12.39%	140		83	0.004	1	77	0.002	1	46.50670274	21.5723862
Evergreen Forest	2.10	2.25%	25		83	0.004	1	77	0.002	1	8.443924092	3.91675997
Forested Wetlands	6.44	6.89%	78		NC	NC	NC	NC	NC	NC		
Mixed Forest	6.03	6.46%	73		83	0.004	1	77	0.002	1	24.25728836	11.2518747
Non Forested Wetlands	0.04	0.04%	0		NC	NC	NC	NC	NC	NC		
Other	0.14	0.15%	2		NC	NC	NC	NC	NC	NC		
Pasture	1.40	1.50%	17		86	0.04	0.6	80.75	0.01	0.52	34.95152202	7.11053493
Row Crops	60.49	64.76%	732		88	0.459857	0.6	85.75	0.2548571	0.52	17783.42978	8323.25016
Small Grains	1.73	1.85%	21		85	0.462258	0.6	83.6	0.1929032	0.52	493.7571994	175.633712
Urban	0.16	0.17%	2		NC	NC	NC	NC	NC	NC		
Water	3.35	3.59%	41		NC	NC	NC	NC	NC	NC		
TOTAL	93.41	100%									18391.34642	8542.73543
											9195.673211	1281.41031
Parish reasonable reduction											86%	

Boeuf River - Arkansas State Line to Ouachita River 080901

Coverage Type	Area km2	Percent of Watershed	Acres in Catahoula	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	33% buffers	85% buffers
Deciduous Forest	29.38	1.79%	196	83	0.004	1	77	0.002	1	65.08103217	30.1881896
Evergreen Forest	10.45	0.64%	70	83	0.004	1	77	0.002	1	23.15024433	10.7383663
Forested Wetlands	259.33	15.80%	1730	NC	NC	NC	NC	NC	NC		
Mixed Forest	69.76	4.25%	465	83	0.004	1	77	0.002	1	154.5203555	71.6751047
Non Forested Wetlands	1.71	0.10%	11	NC	NC	NC	NC	NC	NC		
Other	1.02	0.06%	7	NC	NC	NC	NC	NC	NC		
Pasture	81.07	4.94%	541	86	0.04	0.6	80.75	0.01	0.52	1116.290914	227.098137
Row Crops	986.90	60.12%	6584	88	0.459857	0.6	85.75	0.2548571	0.52	159867.5605	74823.4572
Small Grains	158.38	9.65%	1057	85	0.462258	0.6	83.6	0.1929032	0.52	24910.71078	8860.95555
Urban	3.13	0.19%	21	NC	NC	NC	NC	NC	NC		
Water	41.49	2.53%	277	NC	NC	NC	NC	NC	NC		
TOTAL	1641.60	100%								186137.3138	84024.1126
										93068.65692	12603.6169

Parish reasonable reduction 86%

Bayou Macon - Arkansas State Line to Tensas River 081001

Coverage Type	Area km2	Percent of Watershed	Acres in Catahoula	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	33% buffers	85% buffers
Deciduous Forest	17.47	1.90%	22	83	0.004	1	77	0.002	1	7.16581023	3.32389993
Evergreen Forest	8.48	0.92%	10	83	0.004	1	77	0.002	1	3.477878428	1.61323277
Forested Wetlands	45.38	4.95%	56	NC	NC	NC	NC	NC	NC		
Mixed Forest	53.43	5.82%	66	83	0.004	1	77	0.002	1	21.91458414	10.1651987
Non Forested Wetlands	0.04	0.00%	0	NC	NC	NC	NC	NC	NC		
Other	0.27	0.03%	0	NC	NC	NC	NC	NC	NC		
Pasture	50.74	5.53%	63	86	0.04	0.6	80.75	0.01	0.52	129.3939807	26.3239014
Row Crops	604.19	65.86%	746	88	0.459857	0.6	85.75	0.2548571	0.52	18124.46131	8482.86452
Small Grains	116.99	12.75%	145	85	0.462258	0.6	83.6	0.1929032	0.52	3407.458394	1212.06246
Urban	5.10	0.56%	6	NC	NC	NC	NC	NC	NC		
Water	15.30	1.67%	19	NC	NC	NC	NC	NC	NC		
TOTAL	917.34	100%								21693.87196	9736.35321
										10846.93598	1460.45298

Parish reasonable reduction 87%

Tensas River - Headwaters to Jonesville (including 081201

Coverage Type	Area km2	Percent of Watershed	Acres in Catahoula			existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	33% buffers	85% buffers
Deciduous Forest	24.98	0.80%	339			83	0.004	1	77	0.002	1	112.686805	52.2703855
Evergreen Forest	12.21	0.39%	166			83	0.004	1	77	0.002	1	55.08455893	25.5512713
Forested Wetlands	707.15	22.71%	9610			NC	NC	NC	NC	NC	NC		
Mixed Forest	25.32	0.81%	344			83	0.004	1	77	0.002	1	114.2339644	52.9880437
Non Forested Wetlands	25.15	0.81%	342			NC	NC	NC	NC	NC	NC		
Other	1.04	0.03%	14			NC	NC	NC	NC	NC	NC		
Pasture	148.48	4.77%	2018			86	0.04	0.6	80.75	0.01	0.52	4164.879656	847.302794
Row Crops	1946.49	62.50%	26453			88	0.459857	0.6	85.75	0.2548571	0.52	642300.0942	300618.296
Small Grains	166.44	5.34%	2262			85	0.462258	0.6	83.6	0.1929032	0.52	53327.6964	18969.1234
Urban	15.90	0.51%	216			NC	NC	NC	NC	NC	NC		
Water	42.24	1.36%	574			NC	NC	NC	NC	NC	NC		
TOTAL	3114.35	100%										700074.6756	320565.532
												350037.3378	48084.8298
Parish reasonable reduction												86%	

Summary for Catahoula

Coverage Type	Area km2	% of Parish in impaired Segs	Acres		% par(13.7)	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	33% buffers	85% buffers
Deciduous Forest	42.44	0.99%	697			83	0.004	1	77	0.002	1	231.4403502	107.354861
Evergreen Forest	20.69	0.48%	272			83	0.004	1	77	0.002	1	90.15660578	41.8196304
Forested Wetlands	752.53	17.58%	11475			NC	NC	NC	NC	NC	NC		
Mixed Forest	78.74	1.84%	949	13392	21632.3	83	0.004	1	77	0.002	1	314.9261924	146.080222
Non Forested Wetlands	25.19	0.59%	354			NC	NC	NC	NC	NC	NC		
Other	1.31	0.03%	23			NC	NC	NC	NC	NC	NC		
Pasture	199.22	4.65%	2638			86	0.04	0.6	80.75	0.01	0.52	5445.516073	1107.83537
Row Crops	2550.67	59.59%	34516	34516	17896.036	88	0.459857	0.6	85.75	0.2548571	0.52	838075.5458	392247.868
Small Grains	283.43	6.62%	3484	3484	8073.958	85	0.462258	0.6	83.6	0.1929032	0.52	82139.62278	29217.7752
Urban	21.00	0.49%	245			NC	NC	NC	NC	NC	NC		
Water	57.55	1.34%	910			NC	NC	NC	NC	NC	NC		
TOTAL	4032.77		55563		64184.5							926297.2078	422868.733
												463148.6039	63430.31
Parish reasonable reduction												86%	

Buffer Strips: Some, typically in the form of turn rows.
Rotational practices: Cotton (1-2 y)/corn (1y) soybeans (1y)/milo (2y); rice (2 or 3 y)/soybeans (1y).
Tilling Practices: Plant on beds almost entirely, occassionally milo or rice is planted in flat fields using minimal till.
Ranching and Other: No chicken farming, some beef ranching
Crops in order of % area: Soybeans(33), Cotton(30), Sorghum(21), Corn(7), Wheat(5), Rice(5)

Organized by summary of each subsegment

Bayou Chauvin - Headwaters to the Ouachita River

Summary by Subsegment 080102

Coverage Type	Area km2	Percent of Watershed	Acres	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	Composite buffers= 75% buffers	Goal Composite buffers= 85% buffers
Deciduous Forest	7.68	8.16%	108	83.00	0.0040	1	77.00	0.0020	1	35.92	16.66
Evergreen Forest	3.15	3.35%	44	83.00	0.0040	1	77.00	0.0020	1	14.74	6.84
Forested Wetlands	6.71	7.13%	95	NC	NC	NC	NC	NC	NC		
Mixed Forest	19.12	20.31%	269	83.00	0.0040	1	77.00	0.0020	1	89.43	41.48
Non Forested Wetlands	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Other	0.12	0.12%	2	NC	NC	NC	NC	NC	NC		
Pasture	28.29	30.05%	398	86.00	0.0400	0.6000	80.75	0.0100	0.5200	822.50	167.33
Row Crops	14.58	15.48%	205	88.00	0.4472	0.6000	85.75	0.2693	0.5200	4848.41	2465.20
Small Grains	0.29	0.31%	4	85.00	0.3600	0.6000	83.6	0.2933	0.5200	76.10	52.86
Urban	11.74	12.46%	165	NC	NC	NC	NC	NC	NC		
Water	2.48	2.64%	35	NC	NC	NC	NC	NC	NC		
TOTAL	94.17	100%								5887.10	2750.37
										1471.78	412.56

Subsegment reasonable reduction 72%

Bayou Louis - Headwaters to Ouachita River

Summary by Subsegment 080202

Coverage Type	Area km2	Percent of Watershed	Acres	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	Composite buffers= 33% buffers	Goal Composite buffers= 85% buffers
Deciduous Forest	11.57	12.39%	140	83.00	0.0040	1	77.00	0.0020	1	46.51	21.57
Evergreen Forest	2.10	2.25%	25	83.00	0.0040	1	77.00	0.0020	1	8.44	3.92
Forested Wetlands	6.44	6.89%	78	NC	NC	NC	NC	NC	NC		
Mixed Forest	6.03	6.46%	73	83.00	0.0040	1	77.00	0.0020	1	24.26	11.25
Non Forested Wetlands	0.04	0.04%	0	NC	NC	NC	NC	NC	NC		
Other	0.14	0.15%	2	NC	NC	NC	NC	NC	NC		
Pasture	1.40	1.50%	17	86.00	0.0400	0.6000	80.75	0.0100	0.5200	34.95	7.11
Row Crops	60.49	64.76%	732	88.00	0.4599	0.6000	85.75	0.2549	0.5200	17783.43	8323.25
Small Grains	1.73	1.85%	21	85.00	0.4623	0.6000	83.60	0.1929	0.5200	493.76	175.63
Urban	0.16	0.17%	2	NC	NC	NC	NC	NC	NC		
Water	3.35	3.59%	41	NC	NC	NC	NC	NC	NC		
TOTAL	93.41	100%								18391.35	8542.74
										12322.20	1281.41

Subsegment reasonable reduction 90%

Boeuf River - Arkansas State Line to Ouachita River
Summary by Subsegment 080901

Coverage Type	Area km2	Percent of Watershed	Acres	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	Composite buffers= 31.6% buffers	Goal Composite buffers= 85% buffers
Deciduous Forest	29.38	1.79%	8248	83.00	0.0040	1	77.00	0.0020	1	2738.22	1270.14
Evergreen Forest	10.45	0.64%	2934	83.00	0.0040	1	77.00	0.0020	1	974.03	451.81
Forested Wetlands	259.33	15.80%	72795	NC	NC	NC	NC	NC	NC		
Mixed Forest	69.76	4.25%	19582	83.00	0.0040	1	77.00	0.0020	1	6501.30	3015.66
Non Forested Wetlands	1.71	0.10%	481	NC	NC	NC	NC	NC	NC		
Other	1.02	0.06%	287	NC	NC	NC	NC	NC	NC		
Pasture	81.07	4.94%	22755	86.29	0.0400	0.6000	80.75	0.0100	0.5200	47123.46	9554.94
Row Crops	986.90	60.12%	277024	88.29	0.4524	0.6000	85.75	0.2492	0.5200	6638483.61	3077966.04
Small Grains	158.38	9.65%	44458	85.29	0.4043	0.6000	83.60	0.1910	0.5200	919855.77	369122.30
Urban	3.13	0.19%	878	NC	NC	NC	NC	NC	NC		
Water	41.49	2.53%	11646	NC	NC	NC	NC	NC	NC		
TOTAL	1641.60	100%								7615676.39	3461380.89
										5208291.36	519207.13

Subsegment reasonable reduction 90%

Big Creek - Headwaters to Boeuf River (including Big
Summary by Subsegment 080903

Coverage Type	Area km2	Percent of Watershed	Acres	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	Composite buffers= 20.3% buffers	Goal Composite buffers= 85% buffers
Deciduous Forest	15.97	1.43%	3562	83.00	0.0040	1	77.00	0.0020	1	1182.74	548.62
Evergreen Forest	8.62	0.77%	1924	83.00	0.0040	1	77.00	0.0020	1	638.64	296.24
Forested Wetlands	62.15	5.56%	13869	NC	NC	NC	NC	NC	NC		
Mixed Forest	123.11	11.01%	27469	83.00	0.0040	1	77.00	0.0020	1	9119.69	4230.22
Non Forested Wetlands	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Other	0.00	0.00%	1	NC	NC	NC	NC	NC	NC		
Pasture	13.80	1.23%	3080	86.13	0.0400	0.6000	80.75	0.0100	0.5200	6366.78	1293.25
Row Crops	784.55	70.15%	175056	88.13	0.4565	0.6000	85.75	0.2323	0.5200	4225670.84	1813431.59
Small Grains	91.06	8.14%	20317	85.13	0.3822	0.6000	83.60	0.1698	0.5200	396624.87	149986.47
Urban	10.06	0.90%	2245	NC	NC	NC	NC	NC	NC		
Water	9.07	0.81%	2024	NC	NC	NC	NC	NC	NC		
TOTAL	1118.40	100%								4639603.56	1969786.39
										3699018.66	295467.96

Subsegment reasonable reduction 92%

Bayou Lafourche - Near Oakridge to Boeuf River near
Summary by Subsegment 080904

Coverage Type	Area km2	Percent of Watershed	Acres	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	Composite buffers= 67.5% buffers	Goal Composite buffers= 85% buffers
Deciduous Forest	54.46	3.72%	11520	83.00	0.0040	1	77.00	0.0020	1	3824.58	1774.05
Evergreen Forest	64.30	4.39%	13600	83.00	0.0040	1	77.00	0.0020	1	4515.18	2094.39
Forested Wetlands	253.12	17.30%	53539	NC	NC	NC	NC	NC	NC		
Mixed Forest	102.88	7.03%	21761	83.00	0.0040	1	77.00	0.0020	1	7224.52	3351.13
Non Forested Wetlands	2.72	0.19%	576	NC	NC	NC	NC	NC	NC		
Other	3.74	0.26%	792	NC	NC	NC	NC	NC	NC		
Pasture	177.99	12.16%	37647	86.28	0.0400	0.6000	80.75	0.0100	0.5200	77955.60	15807.81
Row Crops	590.72	40.37%	124945	88.28	0.4377	0.6000	85.75	0.2727	0.5200	2896686.66	1519268.02
Small Grains	108.44	7.41%	22936	85.28	0.3884	0.6000	83.60	0.2298	0.5200	455872.49	229139.94
Urban	75.33	5.15%	15934	NC	NC	NC	NC	NC	NC		
Water	32.21	2.20%	6813	NC	NC	NC	NC	NC	NC		
TOTAL	1463.19	100%								3446079.02	1771435.35
										2325095.72	265715.30
Subsegment reasonable reduction										89%	

Clear Lake
Summary by Subsegment 080910

Coverage Type	Area km2	Percent of Watershed	Acres	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	Composite buffers= 75% buffers	Goal Composite buffers= 85% buffers
Deciduous Forest	0.01	0.24%	3	83	0.004	1	77	0.002	1	1.11	0.51
Evergreen Forest	0.01	0.16%	2	83	0.004	1	77	0.002	1	0.74	0.34
Forested Wetlands	0.01	0.24%	3	NC	NC	NC	NC	NC	NC		
Mixed Forest	0.15	2.64%	36	83	0.004	1	77	0.002	1	12.11	5.62
Non Forested Wetlands	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Other	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Pasture	0.05	0.95%	13	86	0.04	0.6	80.75	0.01	0.52	27.08	5.51
Row Crops	4.84	86.60%	1197	88	0.4472	0.6	85.75	0.26928	0.52	28266.33	14373.92
Small Grains	0.10	1.87%	26	85	0.36	0.6	83.6	0.29333	0.52	473.63	328.95
Urban	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Water	0.41	7.30%	101	NC	NC	NC	NC	NC	NC		
TOTAL	5.59	100%								28781.00	14714.86
										7195.25	2207.23
Subsegment reasonable reduction										69%	

Bayou Macon - Arkansas State Line to Tensas River
Summary by Subsegment 081001

Coverage Type	Area km2	Percent of Watershed	Acres	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	Composite buffers= 40.8% buffers	Goal Composite buffers= 85% buffers
Deciduous Forest	17.47	1.90%	3251	83.00	0.0040	1	77.00	0.0020	1	1079.17	500.58
Evergreen Forest	8.48	0.92%	1578	83.00	0.0040	1	77.00	0.0020	1	523.77	242.95
Forested Wetlands	45.38	4.95%	8443	NC	NC	NC	NC	NC	NC		
Mixed Forest	53.43	5.82%	9941	83.00	0.0040	1	77.00	0.0020	1	3300.34	1530.88
Non Forested Wetlands	0.04	0.00%	8	NC	NC	NC	NC	NC	NC		
Other	0.27	0.03%	50	NC	NC	NC	NC	NC	NC		
Pasture	50.74	5.53%	9441	86.17	0.0400	0.6000	80.75	0.0100	0.5200	19524.50	3964.38
Row Crops	604.19	65.86%	112417	88.17	0.4603	0.6000	85.75	0.2371	0.5200	2737225.52	1188735.09
Small Grains	116.99	12.75%	21767	85.17	0.4092	0.6000	83.60	0.1870	0.5200	455201.77	176956.35
Urban	5.10	0.56%	949	NC	NC	NC	NC	NC	NC		
Water	15.30	1.67%	2847	NC	NC	NC	NC	NC	NC		
TOTAL	917.34	100%								3216855.06	1371930.23
										1903540.87	205789.53

Subsegment reasonable reduction 89%

Joe's Bayou - Headwaters to Bayou Macon
Summary by Subsegment 081002

Coverage Type	Area km2	Percent of Watershed	Acres	existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	Composite buffers= 44.9% buffers	Goal Composite buffers= 85% buffers
Deciduous Forest	2.15	0.87%	93	83.00	0.0040	1	77.00	0.0020	1	30.89	14.33
Evergreen Forest	5.08	2.05%	220	83.00	0.0040	1	77.00	0.0020	1	72.96	33.84
Forested Wetlands	2.64	1.07%	114	NC	NC	NC	NC	NC	NC		
Mixed Forest	7.46	3.02%	323	83.00	0.0040	1	77.00	0.0020	1	107.13	49.69
Non Forested Wetlands	0.02	0.01%	1	NC	NC	NC	NC	NC	NC		
Other	0.00	0.00%	0	NC	NC	NC	NC	NC	NC		
Pasture	22.89	9.25%	990	86.30	0.0400	0.6000	80.75	0.0100	0.5200	2050.46	415.70
Row Crops	140.02	56.59%	6055	88.30	0.4662	0.6000	85.75	0.2355	0.5200	149538.21	63586.28
Small Grains	62.30	25.18%	2694	85.30	0.4233	0.6000	83.60	0.2098	0.5200	58371.30	24576.34
Urban	0.14	0.06%	6	NC	NC	NC	NC	NC	NC		
Water	4.73	1.91%	204	NC	NC	NC	NC	NC	NC		
TOTAL	247.44	100%								210170.95	88676.18
										101755.63	13301.43

Subsegment reasonable reduction 87%

APPENDIX I: Public Comment and Response

Northern Louisiana Timberlands

Weyerhaeuser
the future is growing'

P.O. Drawer 1100
Ruston, LA 71273-1100
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May 21, 2002
Ellen Caldwell
Environmental Protection Specialist
Water Quality Protection Division
U.S. Environmental Protection Agency Region 6
1445 Ross Ave.
Dallas, TX 75202-2733

Dear Ms. Caldwell:

I have been asked to review draft TMDL reports on behalf of Weyerhaeuser (formerly Willamette Industries) of Ruston, Louisiana for the purpose of assisting them in understanding some of the technical details and providing comments on the TMDL reports to the EPA as a part of the public review process. The particular review discussed herein is for the "Total Maximum Daily Load (TMDL) for TSS, Turbidity, and Siltation for 13 Subsegments in the Ouachita River Basin" submitted to EPA by the Louisiana Department of Environmental Quality on March 31, 2002. More specifically these comments relate to two of the subsegments discussed in this TMDL report, Little River -Castor Creek (081601) and Little River - Bear Creek (081602).

First, I would like to emphasize that I fully understand the difficulty that an agency such as Louisiana DEQ has in trying to implement such an extensive water quality program as the TMDL program, Particularly with limited resources and personnel. I applaud their efforts in trying to improve water quality within our state, and in no way do I wish any of the following comments to be perceived as critical of those efforts. Still, there are some points in this draft TMDL report with which I disagree.

Based on my reading of the report, I understand that Louisiana DEQ is proposing that LDEQ subsegment 081601 (Little River - Castor Creek and Dugdemona River to Bear Creek) be included on the Louisiana 303(d) list for turbidity and that LDEQ subsegment 081602 (Little River - Bear Creek to Catahoula Lake) be included on the Louisiana 303(d) list for turbidity and siltation (Table 4, page 4 of the TMDL report). This recommendation is based on a target turbidity level of 25 NTU as established by Louisiana Water Quality Standards at §1113.B.9 for scenic streams. They have also included these two stream segments in Tables 8 and 9 (page 14 of the report) indicating the percent reduction in TSS loading necessary to bring these streams into compliance. I disagree with these recommendations based on the following observations.

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Since there was no target value previously established for TSS for these streams, LDEQ has attempted to develop a TMDL target based on the relationship between turbidity and TSS, At first glance this would appear to be a reasonable approach. However, as is frequently the case, the difficulty lies in obtaining enough data to develop a statistically reliable relationship. The procedure LDEQ followed is indicated in the report on pages 7 through 9. Two regression equations were developed, one for January-June (wet season) data and another for July-December (dry season) data. The analysis indicates that reasonable relationships have been developed as indicated by an R 2 value of 0.40 for the wet season equation and 0.61 for the dry season equation. The report correctly states that these R 2 values indicate that during the wet season 60% of the variation in TSS remains unexplained by the equation and that during the dry season 39% of the variation remains unexplained. However, they then proceed to use these equations as if they are reliable. While it is true that it is difficult to get extremely high R2 values from natural hydrologic and environmental data, this does not provide justification for using the equations anyway. These R 2 values are simply too small to give us confidence that interpretations made from these equations will be reliable. This is an even more critical issue when, in the final analysis, we are judging a stream to be out of compliance with a TSS of 31.33 mg/I when the target (based on the regression equation) is 25 mg/I (see Table 6, page 10). It is not reasonable to use a model with such a low R 2 value to make a distinction of such a small magnitude.

> *REPLY: Thank you for the comment. Several parameters have been explored, by several groups involved in TMDLs in the area, to better predict the TSS value comparable to the numeric Turbidity standard. The relationship chosen is the best defined to date. It is our intent to gather more data and explore relationships to explain a portion of the variation that is currently unexplained. The target set for TSS is not a standard. The standards do not have a "small magnitude over" acceptance criteria or statistical bounds criteria.*

A more statistically rigorous approach would have been to develop a confidence interval about the regression line or about the individual predicted value of TSS for the given turbidity standard of 25 NTU. With such a large scatter in the data, this approach undoubtedly would have resulted in a large confidence interval and probably would have led to the conclusion that the average values of TSS measured for these streams are well within statistical bounds. For a discussion of the statistical procedures involved see (Haan, C.T 1977. Statistical Methods in Hydrology. Iowa State University Press.)

> *REPLY: Thank you for the comment. The confidence interval would be more appropriate if we were evaluating a single reading. The regression line usage would be a conservative assumption in regard to being protective of water quality. The average of the monitoring data is used, which will bring the value to the middle. Using the upper bound of a confidence interval applied to a target value would allow the monitoring average value to be compared to a target value that has been increased by the amount of variation in the data. That would make it very difficult for a segment to be declared impaired. We will obtain the Haan publication and see if that statistical approach can be applied in the future.*

In general, similar comments can be made for the comparisons in turbidity, even though the turbidity target is based on a specified standard rather than the results of a regression equation. It would take much more data than we have available to conclude that the value of 25.81 NTU shown in Table 6, page 10 is significantly different than the target value of 25 NTU. Table 7, page 10 indicates an even closer match

with 25.5 NTU in the stream compared to a target of 25 NTU. Natural variation in background turbidity can easily account for such small differences.

REPLY: Thank you for the comment. The standards do not have a "small magnitude over" acceptance criteria or statistical bounds criteria. The positive side of the numbers being so close together is that a small improvement in Best Management Practices could result in meeting the standard very soon.

In the process of reviewing this TMDL report, these observations led to another issue. These numbers are so close to the target values that I felt it was appropriate to look at the original data from which these averages were determined, since a few small miscalculations could have easily altered the final conclusions. The original data sets for these streams were not included in the document, so I searched for them on the LDEQ web site (http://www.deq.state.la.us/surveillance/wqdata/wqnsites.stm. In fact, the data I found on that site for these two streams did give me a different answer than reported in the TMDL report. As far as I can tell, based on the information provided in the report, I calculated the numbers in the same way. But in every case, the five-year, seasonal averages I calculated from the data were below target values indicated in Tables 6 and 7 for stream subsegments 081601 and 081602. Perhaps there was more data than I had access to, but since this data set is available to the public, it seems to be worth rechecking the numbers.

REPLY: Thank you for the comment. The target values and percent reductions were revised in tables 6 and 7 for subsegments 081601 and 081602.

However, regardless of the outcome of rechecking the data, my earlier statements are still valid. My averages came out slightly below the target values. The report indicates averages slightly above target values. The critical issue is to determine the natural background concentrations of turbidity and TSS with a reasonable degree of statistical confidence. All of the numbers shown are so close to target values that it is difficult to ascertain that these levels are significantly different from natural background levels.

Thank you for taking the time to review these comments. I would be pleased to go into any of these issues in more detail if deemed appropriate.

Sincerely,

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McDermott International Professor of Civil Engineering
Louisiana Tech University

cc Ed Smith - Weyerhaeuser
Andy Kepper - Weyerhaeuser
Jami Nettles - Weyerhaeuser
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Tensas River - Headwaters to Jonesville (including
Summary by Subsegment 081201

Coverage Type	Area km2	Percent of Watershed	Acres		existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	Composite buffers= 35.7% buffers	Goal Compo buffers 85% bu
Deciduous Forest	24.98	0.80%	11738		83.00	0.0040	1	77.00	0.0020	1	3896.91	18
Evergreen Forest	12.21	0.39%	5738		83.00	0.0040	1	77.00	0.0020	1	1904.92	8
Forested Wetlands	707.15	22.71%	332346		NC	NC	NC	NC	NC	NC		
Mixed Forest	25.32	0.81%	11899		83.00	0.0040	1	77.00	0.0020	1	3950.42	18
Non Forested Wetlands	25.15	0.81%	11818		NC	NC	NC	NC	NC	NC		
Other	1.04	0.03%	488		NC	NC	NC	NC	NC	NC		
Pasture	148.48	4.77%	69782		86.28	0.0400	0.6000	80.75	0.0100	0.5200	144498.04	293
Row Crops	1946.49	62.50%	914806		87.41	0.4638	0.6000	85.75	0.2289	0.5200	22250085.27	93380
Small Grains	166.44	5.34%	78225		85.28	0.4038	0.6000	83.60	0.1745	0.5200	1616197.91	5934
Urban	15.90	0.51%	7472		NC	NC	NC	NC	NC	NC		
Water	21.24	0.68%	9984		NC	NC	NC	NC	NC	NC		
TOTAL	3114.83	100%									24020533.47	99652
											15441596.99	14947

Subsegment reasonable reduction 90%

Lake St. Joseph (Oxbow Lake)
Summary by Subsegment 081202

Coverage Type	Area km2	Percent of Watershed	Acres		existing Runoff curve by practice	existing Cover & Mangmnt	existing Support Practice	Goal(85%) Runoff curve by practice	Goal(85%) Cover & Mangmnt	Goal(85%) Support Practice	Composite buffers= 12.9% buffers	Goal Compo buffers 85% bu
Deciduous Forest	1.12	0.39%	47		83.00	0.0040	1	77.00	0.0020	1	15.48	
Evergreen Forest	0.60	0.21%	25		83.00	0.0040	1	77.00	0.0020	1	8.26	
Forested Wetlands	68.10	23.77%	2848		NC	NC	NC	NC	NC	NC		
Mixed Forest	2.68	0.93%	112		83.00	0.0040	1	77.00	0.0020	1	37.16	
Non Forested Wetlands	1.30	0.45%	54		NC	NC	NC	NC	NC	NC		
Other	0.00	0.00%	0		NC	NC	NC	NC	NC	NC		
Pasture	7.62	2.66%	318		86.60	0.0400	0.6000	80.75	0.0100	0.5200	661.62	1
Row Crops	190.67	66.46%	7962		86.43	0.4472	0.6000	85.75	0.2355	0.5200	184626.60	836
Small Grains	6.29	2.19%	263		85.60	0.3783	0.6000	83.60	0.1589	0.5200	5101.08	18
Urban	1.73	0.60%	72		NC	NC	NC	NC	NC	NC		
Water	6.69	2.33%	279		NC	NC	NC	NC	NC	NC		
TOTAL	286.89	100%									190450.21	855
											165826.91	128

Subsegment reasonable reduction 92%